

Missouri State of the Workforce Report 2004

**Prepared for
The Missouri Training
and Employment Council**

By



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Project Overview

Missouri has no greater economic development imperative than developing a skilled, qualified workforce...nothing is more important in light of low-wage competition from third world countries...if we do not transition from a 20th to 21st century economy, we know that Missouri will be left behind.

**– Missouri Governor Robert Holden
Governor's 2003 Workforce Conference
October 9, 2003**

Purpose

As charged by the Governor in the report *Missouri Work: An Action Plan for Economic Growth (2003)*, the Missouri Training and Employment Council must develop a State of the Workforce Report to identify gaps in skills and education of the workforce and recommend strategies to increase essential skills and knowledge that will help people get and keep quality jobs.

To meet this charge, the Missouri Training and Employment Council contracted with the Corporation for a Skilled Workforce (CSW) to identify relevant data, synthesize the efforts of various statewide committees and workgroups, identify best practices, and produce a summary report. The recommendations made by CSW are based on more than 12 years of experience working with over 40 states and 100 local areas.

Process and Format

In addition to its own expertise, CSW assimilated the work of various committees and stakeholders, including the efforts of the National Governor's Association (NGA) Academy Policy Team (Academy Team). The Academy Team worked with five other states as convened by NGA in order to identify ways to improve the workforce system.

Reacting to data, the efforts of other committees, and the latest indicators from the education system, the Academy Team identified 11 recommendations (strategies) that Missouri must pursue if it is to be competitive in the workforce and economy of the 21st century.

These 11 recommendations form the basis for the report's format, each receiving its own section. Other efforts and supporting data are integrated within each of these sections.

This State of the Workforce Report is the central document in a suite of products that have been developed to meet the project's purpose. In addition to this report, CSW has also developed:

Comparative Workforce Indicators® for the State of Missouri – a report that details how Missouri compares to Illinois, Iowa, Kansas, and the U.S. in 10 major categories

(plus over 40 levels of data detail). This report is an addendum to the ***Missouri State of the Workforce Report***.

When published, the ***Missouri State of the Workforce Report*** will be available on CD-ROM and may be obtained from the Missouri Training and Employment Council, 421 E. Dunklin Street, P.O. Box 1087, Jefferson City, MO 65102. Telephone: (573) 526-8229. The report is also available on the Web:

<http://www.ded.mo.gov/employment/mtec/>

A Balanced Scorecard for Missouri's Workforce System – a report that details the importance of tracking system indicators to identify areas in need of improvement, and those areas where success can be celebrated. Examples of potential indicators are provided.

CSW takes its role as a national consultant very seriously; this report attempts to assimilate and synthesize as necessary, as well as identify those areas that require the most immediate attention. CSW presents this document as a compelling call to action.

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Executive Summary

(may be seen at <http://www.ded.mo.gov/employment/mtec/>)

A Need to Embrace Change and Innovation

The economy and the world of work are changing rapidly and the pace of change is increasing. The future belongs to those who can embrace change and seize opportunity when it arises. According to Richard Florida, author of *The Rise of the Creative Class*, “The creative economy rewards constant innovation, the product of human creativity.” On Florida’s creativity index, the largest 49 cities in the country were ranked for creative class, innovation, high tech, and diversity. Two Missouri cities appeared on the list, but in the bottom half: Kansas City at 25th place and St. Louis at 31st, behind other Midwestern cities such as Columbus, Ohio; Indianapolis, Indiana; Minneapolis, Minnesota; and Chicago, Illinois.

Change and innovation require an educated, skilled, and adaptable workforce. Data shows that Missouri is losing ground. Over 10,000 students drop out of Missouri high schools each year. Over a four -year period representing a group of high school classes, this equates to 40,000 students who have dropped out. This is more than the total population of many Missouri cities and towns. Given that education is the centerpiece, the hallmark of the knowledge economy, how can Missouri accept so many lost assets?

Missouri in the New Economy

The label for the economic and workplace transformation of the new century ranges from “new economy” to “information economy” to “knowledge economy,” and encompasses perhaps dozens of others along the way. Regardless of the label, it is clear that today’s economic and workplace environment differs greatly from earlier versions.

The “new economy” may be defined as “a world in which people work with their brains instead of their hands. A world in which communications technology creates global competition – not just for running shoes and laptop computers, but also for bank loans and other services. A world in which innovation is more important than mass production; a world in which investment buys new concepts or the means to create them, rather than new machines; a world in which rapid change is a constant; a world at least as different from what came before it as the industrial age was from its agricultural predecessor; a world so different its emergence can only be described as a revolution.” (www.hotwired.lycos.com)

How does Missouri fare in this new economy? Perhaps the best source of information on state performance in this new economy is **The 2002 State New Economy Index**,¹ produced bi-annually by the Progressive Policy Institute. Among the many indicators produced in the report, Missouri ranks average or lower in many of them. (Definitions are contained in Appendix A; a link to the full report is provided in the footnote number 2.)

¹ *The 2002 State New Economy Index: Benchmarking Economic Transformation in the States*, Robert D. Atkinson, Ph.D., Progressive Policy Institute, Technology and New Economy Project, June 2002.
<http://www.neweconomyindex.org/states/2002/>

The problem appears spread through the three key spheres of development – government, education, and business. The issues revealed by the data are varied, widespread, and most important of all, shared.

New Economy Indicators

Indicator	Missouri Score	Missouri Rank of all States	U.S. Average	Top Ranked State (Score)	Bottom Ranked State (Score)
IT Professionals	1.7%	18 th	1.7%	Colorado (3.3%)	North Dakota (0.3%)
Manufacturing Workforce Education	0.67	40 th	1.0	Hawaii (1.76)	Arkansas (0.01)
Gazelle Jobs	13.9%	17 th	13.8%	Washington (16.5%)	Hawaii (18.5%)
Commercialized Internet Domain Names	0.52	33 rd	0.95	California (1.86)	South Dakota (0.29)
Digital Government	3.06	28 th	3.00	Michigan (4.49)	Vermont (0.93)
Scientists and Engineers	.38%	31 st	0.49%	New Mexico (1.21%)	Nevada (0.22%)
Industry R&D Investment	.81%	29 th	1.91%	Rhode Island (4.29%)	South Dakota (.08%)
Venture Capital	.34%	25 th	1.10%	Massachusetts (3.58%)	North Dakota, Wyoming (0.00%)
Overall Score	58.85	24 th	60.32	Massachusetts (90.00)	West Virginia (40.71)

Source: 2002 State New Economy Index²

Fostering a Cluster-Based Strategy

The sense of sharing the issues involved with the new economy indicators among government, education, and business is a good place to start a conversation about industry clusters. Taking an industry cluster approach requires the active involvement of all three spheres of action.

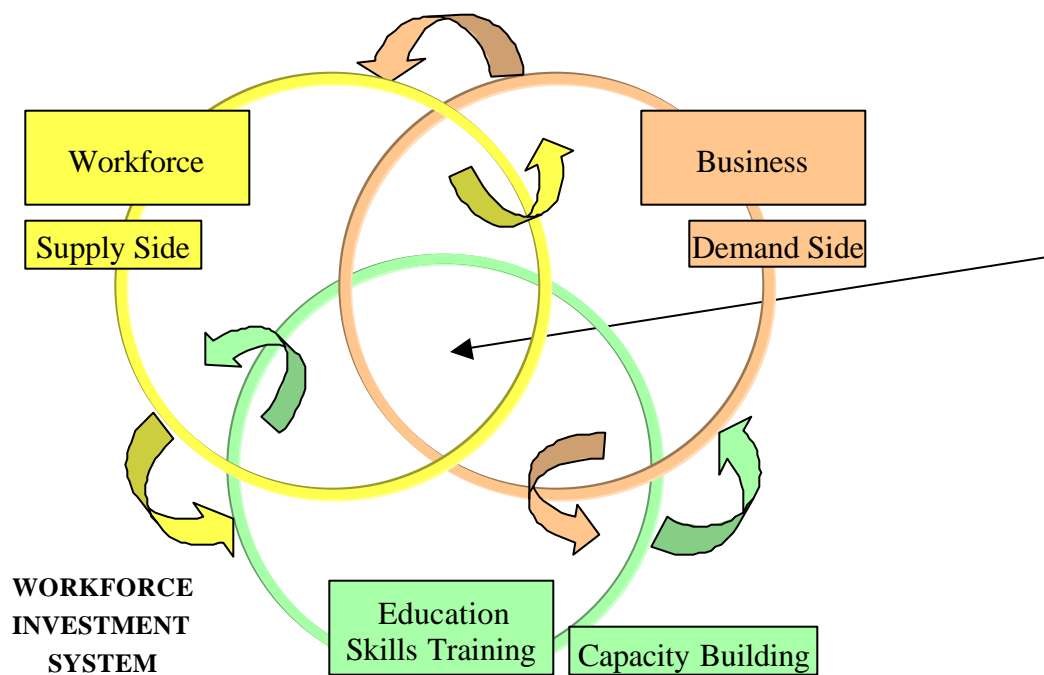
Change is happening so rapidly that it is hard to get a handle on it long enough that our citizens and leaders can recognize and embrace it, while fostering still more change and innovation. Unless there can begin an identification of shared values, business practices, workforce needs, and training strategies, Missouri will be less able to take advantage of economic opportunities that present themselves than states that have already reached

² See Appendix A for full definitions

consensus on a course of action. One area in which the dynamics of change can be systemically approached is through clusters of like businesses working together with government and education to ensure that Missouri has a properly skilled workforce to succeed in the 21st Century.

Workforce development, economic development, and student development (i.e., education) are closely inter-related and growing together more every day. Businesses will locate or expand where there is a strong labor pool. Parents will move their homes to areas where the best schools are in hopes that will better prepare their children for college and ultimately the workplace. Workers should seek out employers who understand and value the need for lifelong learning and continuous skills development.

In many states and regions, the relationship between these three areas of development manifests itself in the form of cluster-based strategies. By bringing similar, related, or complementary businesses together, clusters can help identify and meet the challenges involving economic infrastructure, skilled labor pools, and business involvement in education.



Many states, metropolitan areas, and other areas are turning to cluster-based strategies in order to remain competitive in an era when local geographies are competing with one another as well as countries around the globe for companies and talented employees.

The Missouri Economic Research and Information Center (MERIC) has undertaken various efforts to begin identifying clusters of importance to the State of Missouri. They have identified three potential clusters including advanced manufacturing, information technology, and life sciences. In addition, MERIC has launched “Target Missouri II” (TM2). TM2 is a MERIC-inspired initiative to both revive and revamp the idea of targeting industry clusters. The new system will take into account sub-economies within the state,

because of the belief that different industries affect regions differently. MERIC will evaluate the current industry mix within a region; identify which industries generate the greatest economic impact; look at site selection criteria; gauge a region’s capacity to attract certain industries; and assist them in developing short-term and longer-term economic development strategies.³

These efforts by MERIC are very promising on a number of fronts, including the supply of localized information that can be tailored to meet individual area needs. These efforts should be applauded. They must also be discussed and validated by a wider audience, such as the Missouri Training and Employment Council. Data should drive the decision, but anecdotal factors must also be considered before ultimately deciding on which clusters to focus. Before the state can decide on clusters, it must first consider and answer the question “what kind of economy do we envision for Missouri’s future?” Many states are chasing the biotechnology golden goose. Others are concentrating on small business as a cluster in and of itself. What will Missouri’s clusters turn out to be? The dialogue to determine Missouri’s clusters needs to begin very soon; if this decision is to be left to the local areas, they must know that in advance of doing localized versions of this report.

What is a cluster? The National Governor’s Association defines it as a group of similar, related, or complementary businesses that are geographically bounded; provide active channels for business transactions, communications, and dialogue; share specialized infrastructure, labor markets, and services, and are faced with common opportunities and threats.¹

Businesses benefit from a cluster-based approach because it can provide more access to suppliers and customized support services, enlarged skilled labor pools, and the inevitable transfer of knowledge that occurs where people casually meet to talk business. Also, companies can focus on what they know and do best rather than support services that can otherwise be centralized, use resources more efficiently, and collectively produce more than the sum of their individual outputs¹.

³ <http://www.ded.state.mo.us/business/researchandplanning/industry/targetii/index.shtml>

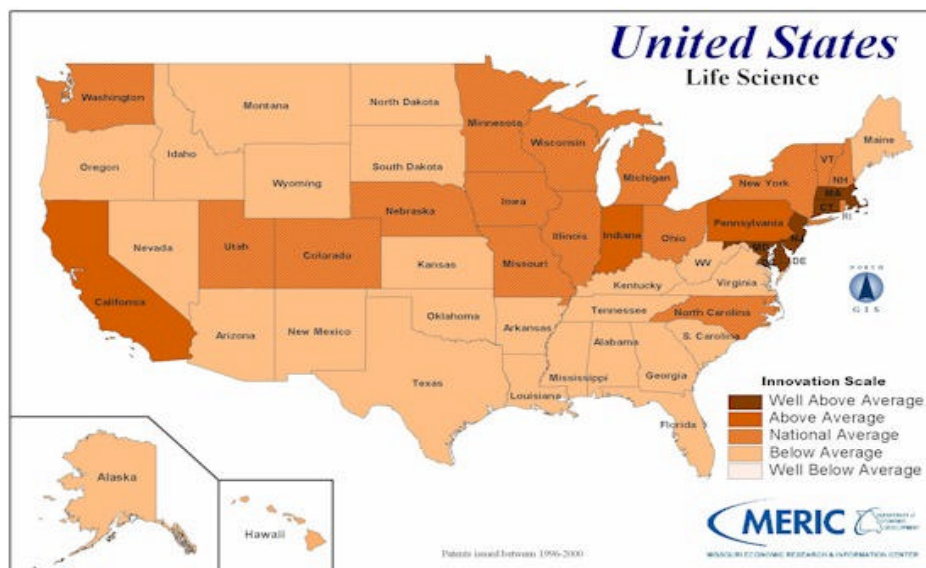
While local area policy makers should contact MERIC for additional information about their own specific local area (or look for their local area on the link provided in footnote number 3.), this report will focus on statewide cluster targets as a common theme throughout.

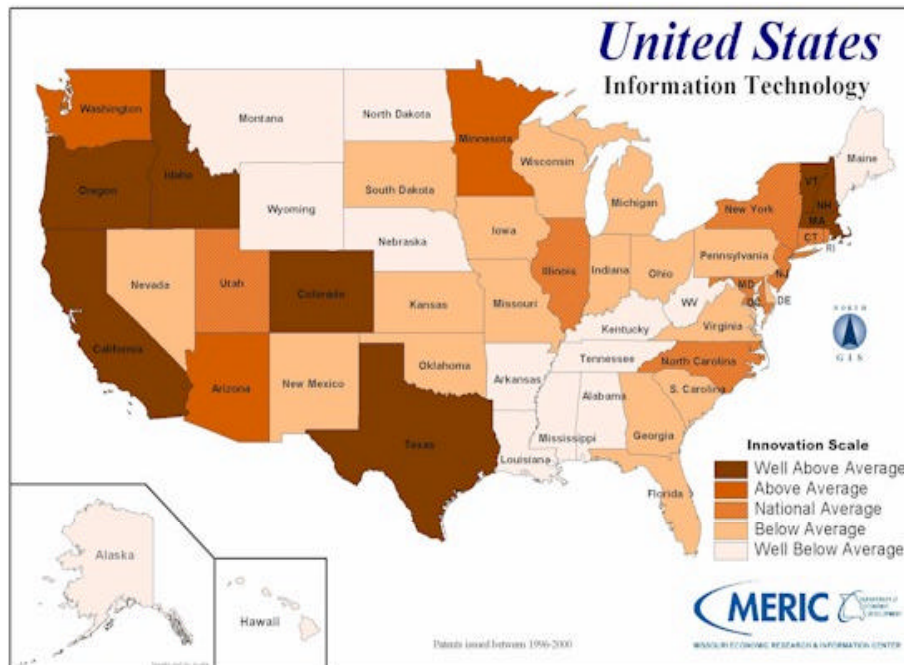
It is important to note that while advanced manufacturing, information technology, and life sciences are very important to Missouri's economy (as the table below demonstrates). The maps that follow show that the state still trails relative to other states in two of these important clusters.

Economic Impact of Missouri's Targeted Clusters

	Advanced Manufacturing	Information Technology	Life Sciences
Number of Firms in Missouri	1,348	3,471	1,250
Average Salary	\$52,430	\$53,563	\$38,000
Direct Jobs	121,520	74,558	170,000
Indirect Jobs	303,280	139,122	266,000
Direct Income	\$6.4 Billion	\$3.9 Billion	\$6.7 Billion
Indirect Income	\$10.1 Billion	\$5.0 Billion	\$9.7 Billion
Total Per Capita Income Increase	\$2,949	\$1,603	\$2,931
Total Contribution to Economy (in 1999 Dollars)	\$29.8 Billion	\$14.4 Billion	\$23.0 Billion
Percent Of State Economy	18.5%	8.9%	13.5%

MERIC (http://www.ded.state.mo.us/business/researchandplanning/industry/target_industries/)





When considering if these are the right clusters for Missouri, bear in mind that these three clusters account for over 40 percent of the state's economy, contributing over \$60 billion dollars annually (in 1999 dollars). They are responsible for over 360,000 direct jobs and an additional 700,000+ indirect jobs.

Bringing a Cluster-Based Strategy to Workforce Development

There are lessons to be learned from other states and workforce areas regarding cluster-based strategies. There tends to be initial interest, typically around a concrete initiative or program or campaign of some sort. However, the hard work after convening cluster groups is to keep them coming back. Keeping the group actively moving toward their goals and outcomes is essential to sustain interest and commitment. The following strategies outline ways workforce development policy makers and professionals can engage in cluster-based work⁴:

- **Training**, including upgrading worker skills, workplace literacy training, and developing customized training for employers in the industry.
- **Sector Research and Analysis**, including interviewing target industry and area employers, interviewing students thinking about careers in the cluster about why they make the career choices they do, and developing new methodologies for measuring inputs or outputs of the industry.
- **Worker Retention**, including assisting employers in developing employee training programs aimed at retention, customized to different levels of the organization (entry-level, professional, and managerial).

⁴ *Sector Strategies: A Typology of Strategies Used in Sector Programs*, National Network of Sector Practitioners

- **Employer Engagement**, including working with or helping to form an industry association, and forming sub-groups of networks to spread into the community.
- **Career Pathways**, including developing job classifications, developing skill standards, and creating intermediate and long-term credentials for the cluster.
- **New Worker Recruitment**, including brokering labor force attachment of low-income workers, holding job fairs or career awareness campaigns, and raising the quality of the applicant pool.
- **Organizing for Action**, including building coalitions of stakeholders, creating an advocacy or community engagement campaign and creating a trade association.
- **Enterprise Development**, including developing entrepreneurial training and campaigns, and discovering or creating new markets.
- **Changing policies and practices** that impact the industry, including changing regulations, changing the financing and investment patterns of the cluster, and changing hiring and training practices.

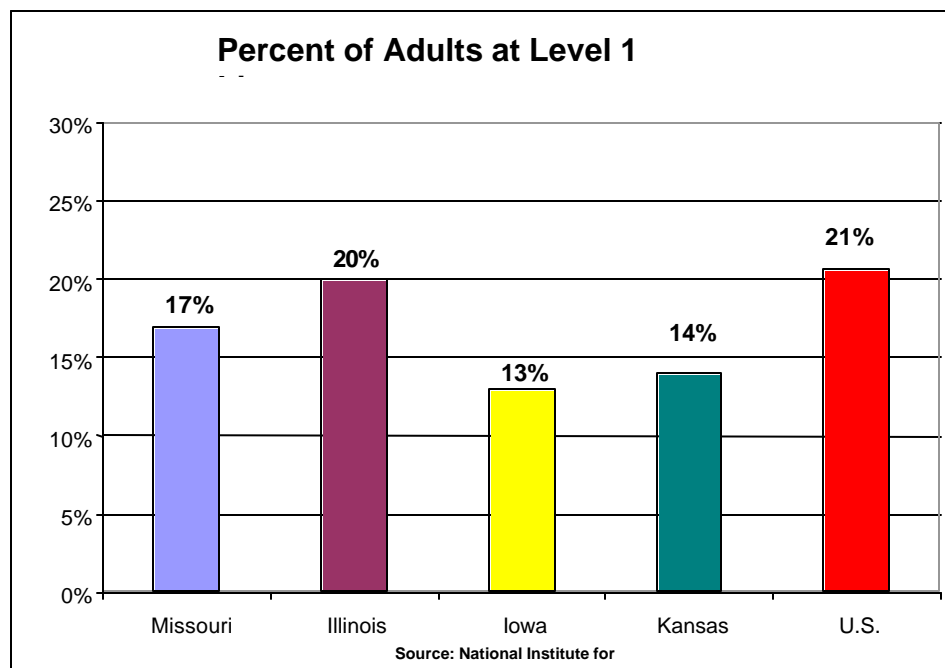
Literacy Must Increase Significantly

In 1992, forty-six percent of Missourians who were tested were not “workplace literate” – loosely defined as being categorized as either Level 1 or Level 2 literate.⁵ For this report, the percentage of citizens who are highly literate will be defined as those that are level 4 or level 5 (reading, comprehension and math skills at the 11th grade level or above).

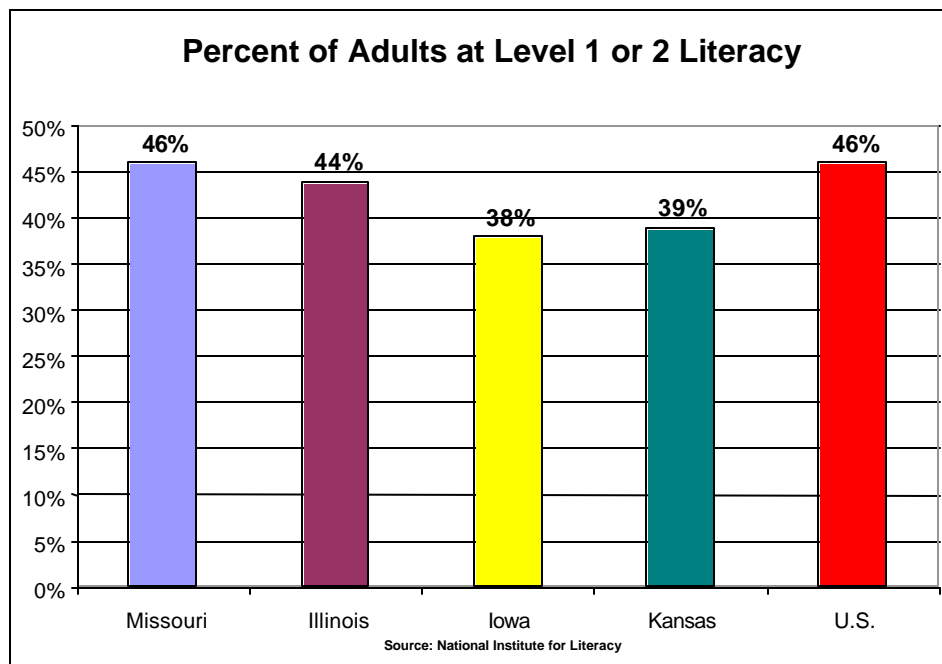
Adults at Level 1 literacy cannot usually

- Locate eligibility from a table of employee benefits.
- Locate an intersection on a street map.
- Locate two pieces of information in a sports article.
- Identify and enter background information on a social security application.
- Calculate total costs of purchase from an order form.

Source: The State of Literacy in America, National Institute for Literacy, 1998.



⁵ The National Adult Literacy Survey (NASL) measures five levels of literacy (Level 1 being the lowest) along three dimensions including prose literacy, document literacy, and quantitative literacy. The NASL Survey is designed to capture an ordered set of information-processing skills and strategies that adults use to accomplish a diverse range of literacy tasks.



The Impact of Low Literacy in America

In 1998 . . .

Poverty – 43 percent of adults at Level 1 literacy were living in poverty, compared to 4 percent at Level 5.

Welfare – the likelihood of being on welfare goes up as literacy goes down. Three out of four food stamp recipients performed in the two lowest literacy levels.

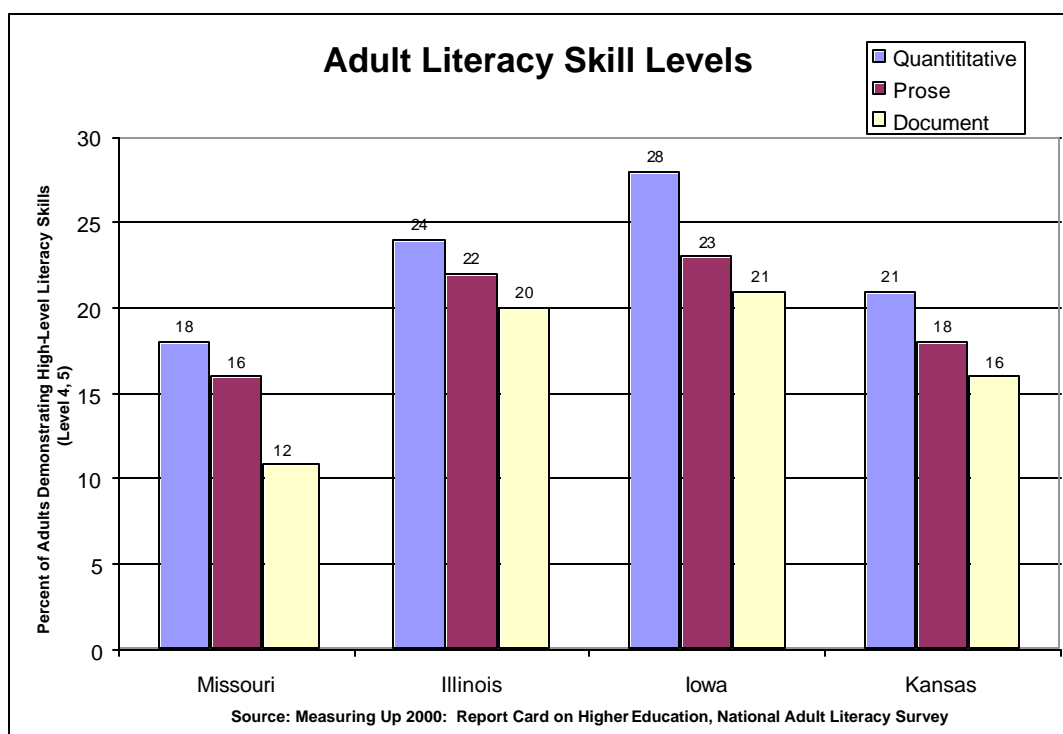
Income – Adults at Level 1 earned a median income of \$240 per week, compared to \$681 for those at Level 5.

Employment Status – Adults at Level 1 worked an average of 19 weeks per year, compared to 44 weeks per year for those at Level 5.

Crime – Seven in ten prisoners performed in the lowest two literacy levels.

Source: The State of Literacy in America, National Institute for Literacy, 1998.

The impacts of low literacy levels cannot be mistaken. Nor can the fact that one of every two Missourians did not meet average levels of adult literacy. The chart below shows that Missouri trailed three neighboring states in all three areas of functional literacy. These three areas of functional literacy cross all industries and occupations. There is perhaps no greater danger to Missouri's place in the 21st Century economy than failing to address the state's glaring literacy deficiencies.



The state of Missouri's literacy problem has not gone unrecognized among policy leaders on the Missouri Training and Employment Council. The Council, efforts have begun to identify ways to meet the challenge head on. What is needed now is a broader base of understanding and support among the executive and legislative branches of government in order to dramatically increase resources directed at this important issue.

Engaging Missourians to improve literacy

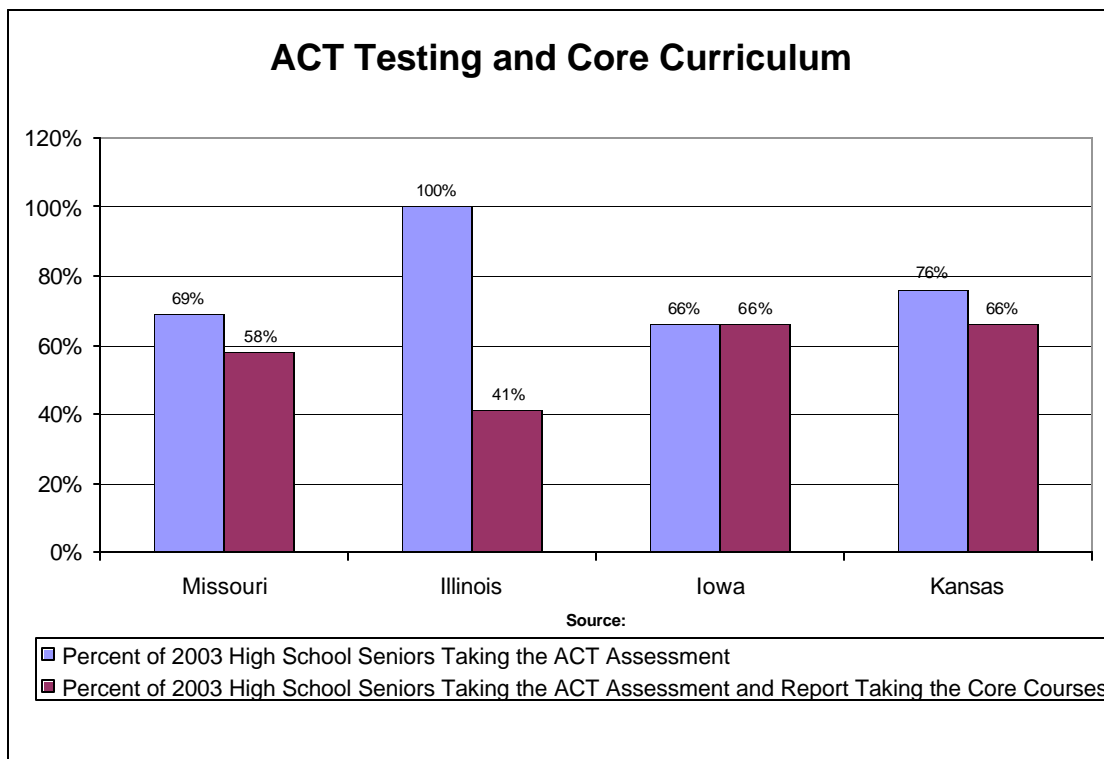
The Missouri Training and Employment Council has been discussing means by which to expand participation by Missourians in literacy programs.

Recommendations include: building literacy instruction into all adult training programs; promoting a common work readiness credentialing system for Missouri; using Missouri Career Centers to identify those in need of literacy training; requiring higher education institutions to develop and promote literacy programs in their communities; encouraging businesses to promote the benefits of literacy in the workplace; and providing literacy training opportunities for all people receiving public assistance.⁶

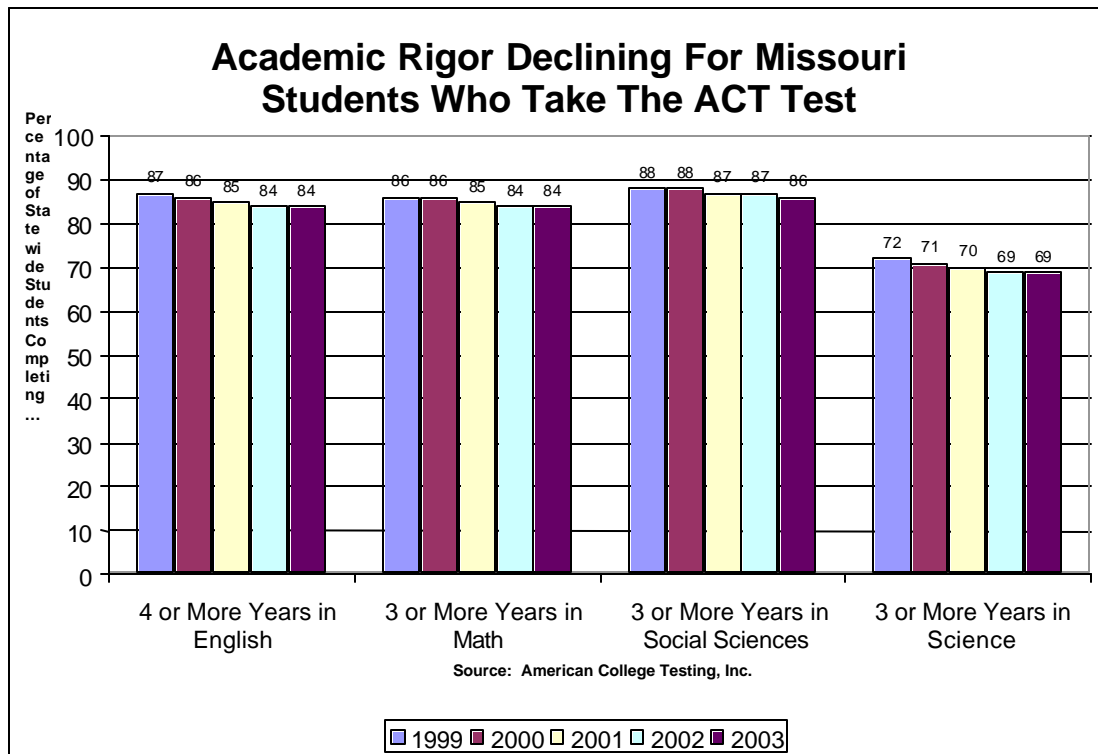
⁶ The State of Literacy in America, National Institute for Literacy, 1998.

High School Graduation Requirements Must Be More Rigorous

The requirements for high school graduation need to be set at a higher level, to include four years of English and three years each of social studies, mathematics and science. Additionally, the Council supports a curriculum that includes foreign language. We believe that foreign language is a critical skill needed by individuals to effectively compete in the 21st Century economy. This improved academic program will bring Missouri in line with the ACT core curriculum.



Yet, at the very time the state needs more academic rigor among its students, there has been a noticeable decline in the percentage of students completing the more demanding academic standards. In the last five years there has been a 3 percent decline in the percentage of students taking four or more years of math; a 2 percent decline in the percentage of students taking three or more years of math; and a 2 percent decline in the percentage of students taking three or more years of social sciences. Likewise, there has been a 3 percent decline in the percent of students taking three or more years of science.



What that means is, if an employer is looking for a skilled workforce with the leadership potential that the jobs of the 21st Century will require, he or she may not be as eager to look at [locating in] Missouri as he or she would be if we closed the gap.

— Quentin Wilson
Missouri Commissioner, Higher Education
Kansas City Star, October 2, 2003

Responding to a recent report regarding Missouri's poor relative position with surrounding states on college participation rates

The challenges facing the education system have been discussed before. Missouri has had a number of economic and workforce-related studies released previously. In the report entitled *A Blueprint for Prosperity and Jobs*⁷ (January 2003), the authors said everything necessary including "Education – basic competencies, workforce development and higher education – are critical pieces of economic development in the 21st Century ... the state needs to do more to ensure the quality of primary and secondary schools in the state ... workforce is the primary issue for most businesses today in determining where they locate and compete. If Missouri's education system does not improve, the state's workforce ... will not have the skills to satisfy the needs and demands of new economy employers."

Academic rigor is only part of the problem. Consider the data indicators in the tables below. The data table below presents key "college prep" indicators for Missouri,

⁷ *A Blueprint for Prosperity and Jobs*, Development Strategies, prepared for the Missouri Department of Economic Development, January 2003, funded by Missouri Development Finance Board

relative to their comparison states, as well as top states from across the country. It is easily seen that Missouri has a great deal of work to do in a number of areas in order to achieve the standing of top states.

Comparative “College Prep” Education Measures⁸

Measurement	Missouri	Illinois	Iowa	Kansas	Top States
9 th to 12 th graders taking at least one upper level math course	51%	N/a	45%	N/a	57%
9 th to 12 th graders taking at least one upper level science course	31%	N/a	35%	N/a	39%
8 th grade students taking algebra	22%	N/a	N/a	N/a	30%
8 th graders scoring at or above “proficient” on national assessment exam in math	22%	27%	32%	34%	34%
8 th graders scoring at or above “proficient” on national assessment exam in reading	29%	N/a	N/a	35%	38%
8 th graders scoring at or above “proficient” on national assessment exam in science	36%	30%	N/a	N/a	42%
8 th graders scoring at or above “proficient” on national assessment exam in writing	17%	N/a	N/a	N/a	31%
Number of scores in the top 20% nationally on SAT/ACT college entrance exam per 1,000 high school graduates	175	218	169	201	201
High school freshmen enrolling in college within 4 years in any state	39%	48%	53%	45%	54%
18 to 24 year olds enrolling in college	32%	33%	35%	39%	41%
25-49 year olds enrolled part-time in some type of post-secondary education	3.7%	4.9%	3.2%	4.3%	5.4%
Share of income that poorest families need to pay for tuition at lowest priced college	12%	12%	16%	12%	8%
Average loan amounts that students borrow each year	\$3,206	\$3,379	\$2,933	\$3,115	\$2,928
1 st year community college students returning their 2 nd year	54%	52%	48%	51%	63%
Freshmen at 4-year colleges/universities returning their sophomore year	75%	76%	81%	73%	83%
Certificates, degrees and diplomas awarded at all colleges and universities per 100 undergraduate students	17	16	20	17	21

⁸ Measuring Up 2002: The State-by-State Report Card for Higher Education, National Center for Public Policy and Higher Education.

**THE NATIONS REPORT CARD, 2003 MATHEMATICS AND READING RESULTS -
National Center for Education Statistics (NCES)**

Measurement	MO	IL	IOWA	KS	Top States Average
8 th graders scoring at or above “proficient” on national assessment exam for math	28	29	33	34	34
8 th graders scoring at or above “proficient” on national assessment exam in reading	34	35	36	35	37

Public and Employer Satisfaction

The following is also excerpted from *Measuring Up 2002*, and represents citizen and employer perceptions of the education system:

Percent of State Residents Who Say...	Missouri	Illinois	Iowa	Kansas	U.S.
The state’s public high schools do an excellent or good job preparing students for college	43%	54%	60%	49%	43%
There are many qualified people who don’t have the opportunity to go to college in the state	49%	53%	40%	44%	52%
The price of college is out of reach in the state	21%	26%	18%	17%	24%
Too many college students in the state are dropping out or taking too long to finish	32%	37%	29%	28%	34%
Colleges contribute a lot to making their part of the state a better place to live and work.	40%	43%	46%	44%	40%

School Rigor and Teacher Development

The Missouri Training and Employment Council supports the recommendation of the Missouri Business Education Roundtable. The Council emphasizes the *Teachers as Professionals* component, which include: developing a more proactive teacher recruitment strategy; strengthening teacher retention policies; improving teacher preparedness; and reinforcing the perception of teaching as a profession.

Also, high school graduation requirements must be more rigorous including four years of English and three years each of social studies, mathematics and science. The Council supports: adopting DESE’s High Schools That Work standards for all high school; increasing high school and postsecondary graduation rates; developing of a 21st Century workforce curriculum for Missouri; and teaching customer service concepts in the schools.

Graduation Must Include Work-Readiness Certification

There is a clear need for the State of Missouri to better link academic standards and core curriculum, and both need to be linked to certification. The state needs a nationally recognized work-readiness credential. Employers and job seekers both must understand and value the meaning of the certification (i.e., knowledge and skills being certified). Many states have already begun this push. This can range from identifying career ladders and industry skill standards to a more generic cross-industry skill certification. Employers must value what a high-school diploma means and represents, i.e., the skills that graduates bring.

Improving Test Performance and Graduation Rates

The Missouri Training and Employment Council has identified the **Missouri Assessment Program (MAP) as a means by which to increase worker readiness.** This includes:

- A focus on testing and accountability, including full funding for the four major areas of the MAP statewide and adopting a statewide workforce readiness assessment for all High School and GED graduates;
- Establishing a publicity campaign, including the delivery of strategic messages regarding the MAP and National Occupational Competency Testing Institute (NOCTI), Competency-Based Curriculum (DESE Profiles), National Institute for Metalworking (NIMS), Work Keys®, etc., as well as the need for student academic and career achievement, and the message among employers and students that transcripts count.
- Devising regional development plans, including the provision of incentives and the establishment of regional employment and training bodies to serve as liaisons between local and state bodies.
- Ensuring that career competencies are an integral part of the core curriculum.

The Council also recommends that high school and post-secondary graduation rates must increase by an appropriately defined percentage. This includes:

- Utilizing standards statewide and financially rewarding outstanding school district performance;
- Linking standards to the A+ Schools Program;
- Requiring teachers and professors to do periodic business internships;
- Imbedding career options into middle school, high school and college course content;
- Imbedding core workplace competencies into middle school, high school and college course content;

- Developing business and education partnerships at the secondary and post-secondary level, including job mentoring and job shadowing programs;
- Eliminating social promotion of students from one grade to the next; and
- Instituting a standard community college entrance exam for evaluating a student's general education and core competencies.

The good news for Missouri is that High School graduation rates are on the rise. Between 1998 and 2002 the rate among public high schools in general has increased from 77.8 percent in 1998 to 82.5 percent in 2002 (Department of Education). Additionally, annual high school dropout rates have been decreasing, from 5.0 percent in 1998 to 3.8 percent in 2002.

Deploying Statewide Skill Assessments

In order to graduate an increasing number of students with a work readiness certification, the state will need to put in place a skills assessment mechanism. The mechanism must be one that is applicable to both youth and adults if it is to be universally meaningful to employers, parents, workers, and students alike.

Many states across the nation are using the National Occupational Competency Testing Institute (NOCTI), Competency-Based Curriculum (DESE Profiles), National Institute for Metalworking (NIMS), and WorkKeys® as this skills assessment mechanism.

WorkKeys® is an assessment system created by ACT for use in the business community. It allows businesses to have a common language regarding workplace skills through job profiling and skills assessment. WorkKeys® presents results on a seven-point numeric scale that can be used to compare the skills of workers with the skills required by the job. Employers can then understand, for example, the difference between a worker with a 3 in teamwork as opposed to a worker with a 5 in teamwork. The scale means something that employers and workers alike understand and value. There are eight different test components measuring eight different skill areas:

- Applied Mathematics
- Applied Technology
- Listening
- Locating Information
- Observation
- Reading for Information
- Teamwork
- Writing

The “basic three” that are used in the vast majority of situations are applied mathematics, locating information, and reading for information. Because there is time and cost associated with each component, additional tests are generally added only as

necessary. The job profile conducted for each position at an employer's workplace provides guidance on the most important skills for the job and the level of those skills required for success. Through WorkKeys® a certificate can be created to provide skill-based credentials to residents that help them secure employment; provide employers with workers that have documented skill proficiencies; and certify applicants so that employers can hire with confidence.

A statewide skill assessment can be used for incumbent workers, dislocated workers, and adult learners, as well as for youth graduating from high school or college. As the state moves towards assessments and credentialing, it will be critical that a seamless system is used, regardless of whether the individual assessed is an emerging or incumbent worker.

Indiana is mounting a \$25 million, five-year statewide WorkKeys® saturation plan. The state counts attaining a score of 5 or more (out of 7 possible) in Reading for Understanding, Applied Mathematics, and Locating Information as a federally reportable skills credential.

Identifying Cross-Sector Knowledge and Skill Requirements

Employers are often quoted by workforce professionals as saying, “just give me someone with basic skills and I’ll train them myself.” Yet, employers are vague about their definition of basic skills and more than one employer means more than one definition. Workforce professionals will also agree to disagree about what is meant by basic skills. More often than not, employers are looking for people who have the right attitude, have a good work ethic, are good team players, and like to learn. They most likely have a much broader set of skills in mind, but lack the framework to describe them. One of the best definitions of skills required for the 21st Century is provided by the Northwest Center for Emerging Technologies (NWCET) in the report *Building a Foundation for Tomorrow*⁹ published in 2000. Originally intended to serve as the framework for the nation’s information technology career cluster, these crosscutting skills represent a thought-provoking list of worker readiness skills sought by nearly every employer.

New Economy Skill Standards¹⁰

CROSS-SECTOR CORE SKILLS

- Project Management
- Task Management
- Problem Solving

⁹ Project developed in part by the National Science Foundation. Partners included Microsoft, The Boeing Company, American Association of Community Colleges, American Electronics Association, Educational Development Center, Department of Commerce, and Department of Labor, in addition to many others.

¹⁰ Adapted from *Building a Foundation for Tomorrow: Skill Standards for Information Technology*, Northwest Center for Emerging Technologies, 2000 (sponsored by National Science Foundation)

CORE KNOWLEDGE

- Analytical Skills and Problem Solving
- Business Organization and Environment
- Coordination and Communication Skills
- Core Computer and Hardware/Software Skills
- Project and Process Flows

EMPLOYABILITY SKILLS

- Communication
- Organization
- Team Contribution and Leadership
- Professionalism
- Critical Thinking and Decision Making
- Customer Relations
- Self-Directed and Continuous Learning

Yet, there are many potential frameworks for the identification of cross-sector knowledge and skills, including those identified by Work Keys®. The following list is based on cluster analysis performed by CSW in previous research and used in many existing reports. CSW has studied over 10 different industry clusters relative to their O*NET characteristics. The following list represents the knowledge requirements that appear among the top 10 in at least half of the industry clusters studied:

O*NET Knowledge Requirements

- Administration and Management
- Clerical
- Computers and Electronics
- Customer and Personal Service
- Economics and Accounting
- Education and Training
- English Language
- Mathematics
- Production and Processing
- Psychology
- Therapy and Counseling

While there are similarities and differences in the two lists above, the point is that there are many frameworks, each adding to the similarities and differences. These frameworks can serve only as a starting point. Ultimately, Missouri must figure out its own cross-sector knowledge and skill needs based on its critical clusters, as well as all

other industries. One approach to this might include a series of local area validation sessions with leading employers where they react to, edit-add-delete, and make other changes to existing frameworks that lead to one appropriately synthesized list.

Alternatively, there is a national worker readiness credential project that is being overseen by the National Adult Literacy Survey through a program entitled Equipped for the Future (EFF). EFF's skill and content standards are outlined below. More can be learned at the following web site <http://www.nifl.gov/nifl/eff.html>. Missouri needs to understand how this project, currently in a five-state pilot development phase, might parallel or intersect its own plans and objectives.

Equipped for the Future (EFF) Content Standards

The following are the sixteen EFF standards and the four fundamental skill categories:

COMMUNICATION SKILLS

- Read with understanding
- Convey ideas in writing
- Speak so others can understand
- Listen actively
- Observe critically

DECISION-MAKING SKILLS

- Use math to solve problems and communicate
- Solve problems and make decisions
- Plan

INTERPERSONAL SKILLS

- Cooperate with others
- Advocate and influence
- Resolve conflicts and negotiate
- Guide others

LIFELONG LEARNING SKILLS

- Take responsibility for learning
- Reflect and evaluate
- Learn through research
- Use information and communications technology

Putting Customer Service (Back) Into the Service Economy

As the national and regional economies continue to transform from manufacturing to service, the need to focus on the customer has become increasingly vital. A service economy is reliant on the ability of workers to properly relate to and communicate with internal and external clients.

The emphasis on the customer is seen in a variety of places in the above knowledge, skills, and curriculum information, including service orientation and customer and personal service as critical characteristics in life science occupations; active listening, information gathering, and speaking as critical skill requirements; and communication skills, professionalism, and customer relations as new economy skill standards. In addition, customer and personal service is seen throughout the interpersonal skills in the Equipped for the Future content standards.

The importance of customer service cannot be understated. Anecdotally, during focus groups and presentations across the country, many people will agree that they have received poor customer service “within the past 48 hours.” Yet, few areas across the country have entered into real discussion about the implications of this essential characteristic. Missouri would be wise to help develop incentives for higher-education to build more comprehensive customer training programs, and work with local area public education leaders to help integrate customer service into K-12 curriculums.

Making Transcripts Count

As part of an employability/portability portfolio, high school transcripts can be used as a direct connection between education and business. Several states and local areas across the nation have started “Transcript Count” campaigns that include a number of components and serve a multitude of purposes. The program can be replicated or tweaked following a number of key steps, including:

1. Make employers aware of the value of high school transcripts in employment selection, either in addition to or in lieu of college transcripts and professional resumes. The value of the high school transcript is three-fold and acts like a credential in and of itself:
 - a. **Attendance record:** an indicator of an employee’s willingness to come to work on time every day;
 - b. **Grade point average:** an indicator of overall work performance;
 - c. **Extra-curricular activities:** an indicator of an employee’s willingness to do more than just his or her basic job description; and
 - d. **Co-curricular activities.**
2. Establish a speakers’ bureau to identify and train a series of young professionals to speak to high school freshmen. Statistical evidence has shown that students

value presentations by young professionals more than presentations by adults who are of their parents' age or older. However, if someone outside of the 21-35 year old age boundary is interested, he or she should not be turned away.

3. Train speakers' bureau members in a two-hour advance session to speak to high school freshmen about (1) the fact that employers have agreed to start asking for high school transcripts; (2) the real cost of living on their own in the area (including house, car, groceries, etc.); (3) career goals and the wages paid for certain occupations; and (4) the value of the high school transcript in getting a good job and meeting career goals, including showing students a high school transcript (which many will never see otherwise).
4. Mount a media campaign aimed at employers who have not yet agreed to request high school transcripts, as well as at students, about the value of education and making their transcripts "all they can be." Many radio stations will air these as public address announcements at little or no charge.

The goal of adopting a common core curriculum and making transcripts count is building toward a credentialing system for both adults and students. As has been shown, there are numerous frameworks for a core curriculum from which to start a conversation. No framework is better or worse than any other for the State of Missouri. Policy and educational leaders, together with business and industry, must identify the most appropriate 21st Century workforce curriculum for Missouri.

Consider the potential workforce if the majority of students graduated with a sound knowledge of project management, problem solving, analysis, production and processing, foreign language, and customer service. In today's worldwide service-based economy based on intellect and creativity, this would be an interesting mix of skills. Regardless of any one suggestion, start the conversation with public, private, and education leaders and spread the dialogue across every community in the state, whether a geographic, industrial, or political community.

Continuous Learning and Skills Development As a Way of Life

To sustain and grow critical industries in the new economy, all workers within the industry – from the entry-level worker to the chief executive – must continuously learn new skills. The world of work is changing too rapidly to allow learning to end at high school or even college. The typical worker will change jobs 10 times in the course of his or her life. Three of these changes will involve major career shifts. Job seekers will have to figure out how to connect their existing skills to the next job, and how to fill the gaps in their knowledge and skill base. Employers will have to learn what skills are available and how to predict and describe what skills they need. The best unemployment insurance is skills and adaptability.

Keep in mind that any systematic credentialing mechanism at the high school level must transition seamlessly to the adult level. The skill needs of the adult worker community may be more difficult to ascertain and often equally hard to assess. How can government resources best be deployed to develop, maintain, and upgrade the skills and knowledge of the existing workforce?

Limited training funds should be directed to those firms in the targeted clusters that are upgrading technology and skills, or to firms that are training workers in transferable skills. Additionally, skill assessments, whether WorkKeys® or an alternative, can ~~begin~~ ~~to~~ serve as the adult worker credential that certify continuous skill development.

Helping Low-Income Workers Achieve a Better Standard of Living: Aiming Toward Self-Sufficiency

Missouri is not unlike any other state in that it has pockets of prosperity as well as pockets of poverty, and areas of strong communities and economically weaker communities. Within the weaker communities, it is important that everyone has an opportunity to attach to the labor market. Over 35 percent of Missouri's working age population is not working and not actively seeking work. The state must proactively work with traditionally underserved populations so that everyone has access to education and skill development opportunities as well as quality jobs.

How can the State of Missouri go about improving the skills of low-income workers? By recognizing that basic supportive services such as food, housing, transportation and child-care are essential components to enhancing education and skills. If parents lack affordable childcare or reliable means of transportation, it is unlikely they can make it to a job interview or maintain employment, if hired. Programs should not only enhance skills but also lead to employment. Training without an achievable employment goal is not an option for most low-skilled workers.

Missouri's workforce development system should strive to increase the labor force participation of those persons traditionally underserved by Missouri's labor market;

specifically persons of low-income; ex-offenders, at-risk youth, young black males, and persons with disabilities. Missouri must initiate a greater interagency effort to link separate programs into a continuum of integrated services, supported by mentoring and individual-based support services, to enable clients to participate in skills-based training and/or employment retention programs. This includes such support services as: food; housing; child care; transportation; emergency cash assistance; job coaching; job shadowing; health care (including mental health); substance abuse education; domestic violence intervention; life skills in vocational and job training, higher education, and GED certification; as well as work readiness certification.¹¹ This could be achieved by collaboration, integration and reallocation of funding as necessary. At least preserving current funding levels for the existing efforts providing these services is recommended while developing more innovative integrated delivery among all agency programs.

TANF Consolidation: A Missouri Best Practice

The Division of Family Services (DFS) provides cash assistance to Missourians. To meet federal requirements, some DFS clients are required to work and/or participate in work-related activities. In the past, DFS provided TANF recipients with resources for direct client services, job readiness, educational activities and community work experience programs. The Division of Workforce Development (DWD) provides direct services to Missouri's economically disadvantaged, unemployed and underemployed adult and youth citizens in the form of employment and training opportunities, designed to increase individual earned income.

For over a decade, people concerned with welfare reform in Missouri have envisioned a better system — one that brings a range of employment opportunities and social supports together in a coordinated, seamless fashion. Faced with limited resources and a growing interest in improving employment and training outcomes for Temporary Assistance for Needy Families (TANF), Missouri Employment and Training Program (METP) and Parents' Fair Share (PFS) recipients, a fundamental change in service delivery was proposed.

In 2003, Missouri consolidated workforce development and supportive activities to improve employment outcomes, customer access and training opportunities for public assistance recipients. By consolidating the targeted resources from the two divisions within the Division of Workforce Development, Missouri is eliminating duplication, increasing efficiency and improving employment outcomes for greater numbers of TANF, METP and PFS recipients. Early performance results are very positive.

¹¹ Adapted by the Special Focus Committee from: *Planning for Service Integration to Support Working Poor Families*, prepared by the Missouri Association for Community Action, September 2003, assisted by a grant from the U.S. Department of Health and Human Services, Office of Community Services.

STEP: A Maryland Best Practice

Another best practice example is the State of Maryland's **Skills-Based Training for Employment Promotion Program** (STEP), created through legislation in 2001.

- The goal of the program is to train low-income working or recently unemployed parents (at 200 percent of poverty or below) to move into jobs with better opportunities for advancement, better pay and benefits.
- Local Workforce Investment Act areas operate the program through competitive grants and provide all employer and participant services.
- There are two components to the program: employer-based and individual based. Participating employers must provide 50 percent of the cost of training. Participants also can receive "wraparound services," such as transportation, training supplies, and childcare.
- Employed participants must be placed in new positions within 6 months of completing training, and employers must provide health benefits upon promotion.
- STEP training has given participants the skills they need to advance in new careers such as surgical technicians, communication technicians, nursing assistants, pharmacy technicians, and medical coders.

For more information visit

http://www.mdworkforce.com/menu.cfm?p_menu=239&cm=66 | 238 | 239

Understanding the Characteristics of Critical Occupations

The focus on higher end clusters such as advanced manufacturing, information technology, and life sciences will predicate the need for a more educated and skilled workforce. Yet, within these still emerging and often not understood clusters, it is important to understand the critical occupations and their associated importance to the vitality of the cluster that make them so critical.

In order to better understand the critical occupations and skills in Missouri's economy, we used staffing patterns and projection data for each of three candidates for target clusters, as well as an "all-industries" matrix that identifies occupations based on a variety of factors, and identifies possible curriculum standards. Consider this last table reflective of the "all-other" cluster, even though it includes the other three clusters as well. This type of list keeps the focus on the entire economy at the same time it is narrowing its focus to the three candidates for target clusters.

A Closer Look at Missouri Advanced Manufacturing

	Number of New Jobs, 2000- 2010	Education and Training Required	Average Annual Wage (2001)	Top Skill Requirements	Top Knowledge Requirements
1. Computer Software Engineers, Systems	196	Bachelor's Degree	\$66,210	<ul style="list-style-type: none"> ➤ Operation and Analysis ➤ Mathematics ➤ Information Organization 	<ul style="list-style-type: none"> ➤ Computers and Electronics ➤ Engineering and Technology
2. Chemical Equipment Operators and Tenders	173	Moderate-term On-the-Job Training	\$37,200	<ul style="list-style-type: none"> ➤ Product Inspection ➤ Operation Monitoring ➤ Testing 	<ul style="list-style-type: none"> ➤ Chemistry
3. Welders, Cutters, Soderers, and Braziers	157	Post-Secondary Vocational Training	\$29,370	<ul style="list-style-type: none"> ➤ Product Inspection ➤ Operation and Control ➤ Equipment Maintenance 	<ul style="list-style-type: none"> ➤ Mechanical ➤ Building and Construction ➤ Production and Processing
4. Electricians	127	Long-term On-the-Job Training	\$46,230	<ul style="list-style-type: none"> ➤ Troubleshooting ➤ Installation and Repair 	<ul style="list-style-type: none"> ➤ Design ➤ Engineering and Technology
5. Semiconductor Processors	124	Associate Degree	N/a	<ul style="list-style-type: none"> ➤ Operation and Control ➤ Operation Monitoring ➤ Equipment Selection 	<ul style="list-style-type: none"> ➤ Production and Processing
6. Computer Support Specialists	124	Associate Degree	\$39,840	<ul style="list-style-type: none"> ➤ Instructing ➤ Operation and Analysis ➤ Troubleshooting 	<ul style="list-style-type: none"> ➤ Computers and Electronics

Top Tasks Performed by Computer Software Engineers, Systems

(These are the same top tasks as for *Computer Software Engineers, Applications*, the top occupation in Information Technology.)

- Analyzes software requirements to determine feasibility of design within time and cost constraints.
- Analyzes information to determine, recommend, and plan layout for type of computers and modifications to existing peripheral equipment.

- Consults with engineering staff to evaluate interface between hardware and software, and operational and performance requirements of overall system.
- Evaluates factors such as reporting formats required, cost constraints, and need for security restrictions to determine hardware configuration.
- Formulates and designs software system, using scientific analysis and mathematical models to predict and measure outcome and consequences of design.

A Closer Look at Missouri Information Technology

	Number of New Jobs, 2000-2010	Average Annual Wage (2001)	Education and Training Required	Top Skill Requirements	Top Knowledge Requirements
1. Computer Software Engineers, Applications	2,620	\$66,760	Bachelor's Degree	<ul style="list-style-type: none"> ➤ Operation and Analysis ➤ Mathematics ➤ Information Organization 	<ul style="list-style-type: none"> ➤ Computers and Electronics ➤ Mathematics ➤ Engineering and Technology
2. Computer Systems Analysts	1,761	\$58,420	Bachelor's Degree	<ul style="list-style-type: none"> ➤ Reading Comprehension ➤ Troubleshooting ➤ Programming 	<ul style="list-style-type: none"> ➤ Computers and Electronics ➤ English Language
3. Computer Support Specialists	1,470	\$39,840	Associate Degree	<ul style="list-style-type: none"> ➤ Instructing ➤ Operation and Analysis ➤ Troubleshooting 	<ul style="list-style-type: none"> ➤ Computers and Electronics
4. Computer Software Engineers, Systems	1,158	\$66,210	Bachelor's Degree	<ul style="list-style-type: none"> ➤ Operation and Analysis ➤ Mathematics ➤ Information Organization 	<ul style="list-style-type: none"> ➤ Computers and Electronics ➤ Mathematics ➤ Engineering and Technology
5. Network and Computer Systems Administrators	761	\$51,300	Bachelor's Degree	<ul style="list-style-type: none"> ➤ Programming ➤ Writing ➤ Implementation Planning 	<ul style="list-style-type: none"> ➤ Computers and Electronics

Top Tasks Performed by Computer Systems Analysts

- Analyzes and tests computer programs or systems to identify errors and ensure conformance to standards.
- Consults with staff and users to identify operating procedure problems.
- Formulates and reviews plans outlining steps required to develop programs to meet staff and user requirements.
- Devises flow charts and diagrams to illustrate steps, and to describe logical operational steps of program.
- Writes documentation to describe and develop installation and operating procedures of programs.

A Closer Look at Missouri Life Sciences

	Number of New Jobs, 2000-2010	Average Annual Wage (2001)	Education and Training Required	Top Skill Requirements	Top Knowledge Requirements
1. Registered Nurses	4,837	\$43,350	Associate or Bachelor's degree	<ul style="list-style-type: none"> ➤ Service Orientation ➤ Speaking ➤ Social Perceptiveness 	<ul style="list-style-type: none"> ➤ Medicine and Dentistry ➤ Biology ➤ Customer and Personal Service
2. Nursing Aides, Orderlies, and Attendants	1,002	\$17,570	Short-term On-the-Job Training	<ul style="list-style-type: none"> ➤ Service Orientation ➤ Social Perceptiveness ➤ Active Listening 	<ul style="list-style-type: none"> ➤ Customer and Personal Service ➤ Medicine and Dentistry ➤ Therapy and Counseling
3. Medical Assistants	885	\$22,420	Moderate-term On-the-Job Training	<ul style="list-style-type: none"> ➤ Service Orientation ➤ Writing ➤ Active Listening 	<ul style="list-style-type: none"> ➤ Medicine and Dentistry ➤ Clerical ➤ English Language
4. Respiratory Therapists	659	\$37,500	Associate Degree	<ul style="list-style-type: none"> ➤ Operation and Control ➤ Monitoring ➤ Reading Comprehension 	<ul style="list-style-type: none"> ➤ Medicine and Dentistry ➤ Biology ➤ Therapy and Counseling
5. Interviewers, Except Eligibility and Loan	494	\$22,510	Short-term On-the-Job Training	<ul style="list-style-type: none"> ➤ Active Listening ➤ Speaking ➤ Reading Comprehension 	<ul style="list-style-type: none"> ➤ Clerical ➤ Computers and Electronics ➤ English Language

Top Tasks Performed by Registered Nurses

- Provides health care, first aid, and immunization in facilities such as schools, hospitals, and industry.
- Observes patient's skin color, dilation of pupils, and output of computerized equipment to monitor vital signs.
- Records patient's medical information and vital signs.
- Administers local, inhalation, intravenous, and other anesthetics.
- Prepares patients for and assists with examinations.

Education System Changes Need to be Top Priority

Career education and the community/technical college system must be expanded and curricula targeted to the just-in-time skill standards, certifications, or licensing requirements of business and industry. Designing and implementing these changes will be some of the most important work done in Missouri over the coming years. One immediate means by which to expand career education, as identified by the Missouri Training and Employment Council, is to expand the **A+ Schools Program**,¹² including consideration of combining or leveraging it with the Advantage Missouri Program¹³ so that students can take advantage of both at the same time. The A+ Schools Program encourages students to stay in school, make career plans, tutor younger students in school, and graduate with the skills and knowledge required for career success or further education.

There are many options for modifying the A+ Schools Program including, increasing funding for tuition, require all schools to meet A+ Schools Program standards, combining the program with some type of skill assessment, and providing local incentives for different local in-demand occupations.

It is clear by now that the state must position itself to do more in the area of skill standards and certifications. Given that need, it is important that there is an understanding of the state's critical industries and occupations.

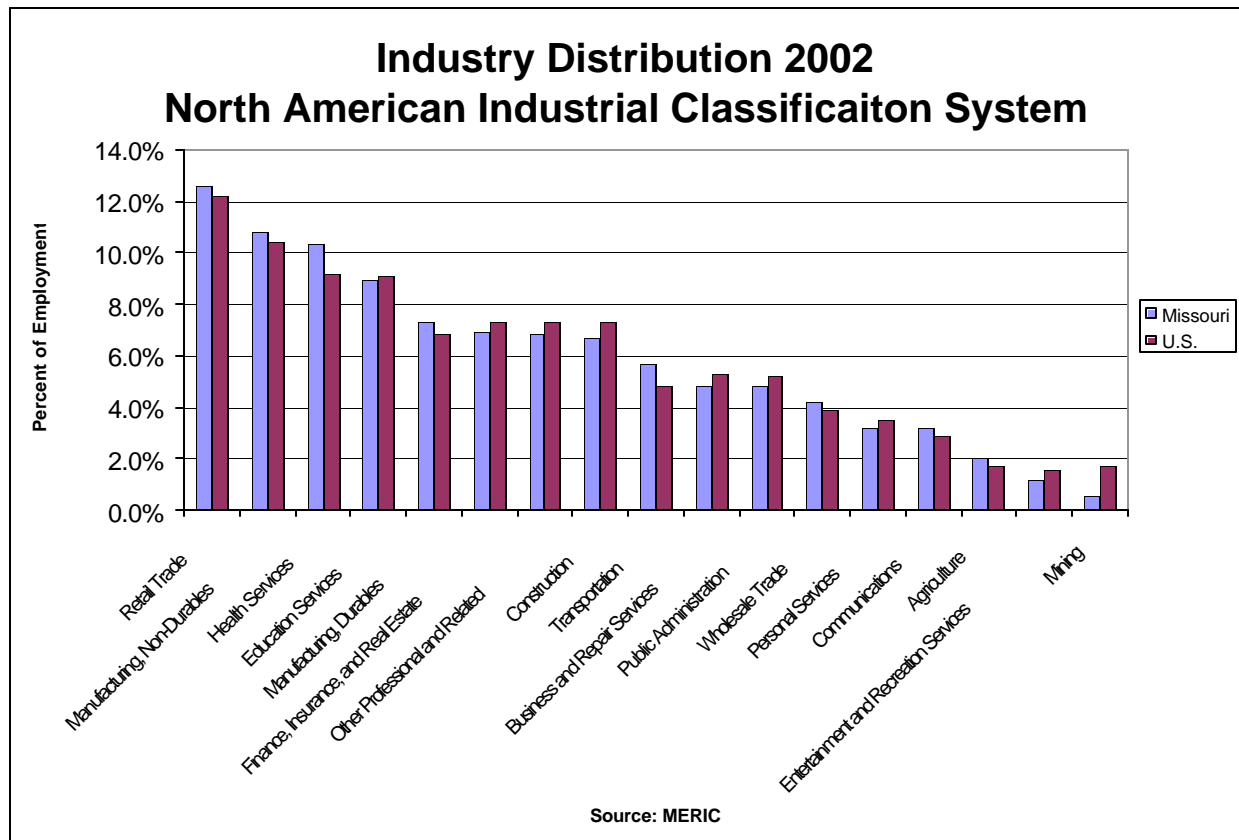
¹² The A+ Schools Program is a school-improvement initiative established by the Outstanding Schools Act of 1993. The program is raising academic standards, opening new doors to higher education and introducing students to the teaching profession through tutoring and mentoring activities. <http://www.bgschools.k12.mo.us/aplus.htm>

¹³ The Advantage Missouri Program provides financial assistance to students in undergraduate programs of study leading to employment by Missouri businesses and industries in high-demand occupational fields including biomedical/biotechnical, advanced manufacturing, and information technology.

Major Industry Distribution by North American Industrial Classification System (NAICS)

NAICS	Missouri	Illinois	Iowa	Kansas	U.S.
Retail Trade	12.6%	11.8%	12.8%	12.0%	12.2%
Manufacturing (non-durables)	10.8%	11.7%	10.4%	10.4%	10.4%
Health Services	10.3%	9.2%	10.2%	10.0%	9.2%
Education Services	8.9%	8.8%	10.8%	10.3%	9.1%
Professional & Related Services	6.8%	7.6%	6.9%	7.6%	7.3%
Finance, Insurance, and Real Estate	6.9%	8.4%	6.9%	6.9%	7.3%
Construction	6.7%	6.0%	5.8%	6.1%	7.3%
Manufacturing (durables)	7.3%	7.3%	7.3%	6.8%	6.8%
Business & Repair Services	4.8%	5.4%	4.3%	4.4%	5.3%
Public Administration	4.8%	4.3%	3.9%	4.8%	5.2%
Transportation	5.7%	5.6%	4.7%	4.9%	4.8%
Wholesale trade	4.2%	4.5%	4.3%	3.9%	3.9%
Personal Services	3.2%	2.9%	3.0%	2.8%	3.5%
Communications	3.2%	2.8%	2.5%	3.3%	2.9%
Agriculture	2.0%	1.3%	4.7%	2.5%	1.7%
Mining	0.6%	1.0%	0.4%	2.2%	1.7%
Entertainment & Recreation Services	1.2%	1.4%	1.2%	1.2%	1.6%

Source: U.S. Census Bureau



Critical Occupations Across Industries

The graph above shows the relative importance of various industry sectors to Missouri's economy compared to their prevalence in the national economy. It is obvious from the graph, for example, that retail trade and health services employ a larger percentage of Missouri's workforce than the national average. Education, on the other hand, employs a smaller percentage than the national average.

In addition to understanding how employment is distributed among industries, it is important to examine the top occupations in the state. The top occupations have been identified by looking at a combination of their employment size, annual wages, and projected growth, because this points to the occupations that offer the greatest opportunity for career choices. If we looked solely at employment size, the list would be dominated by low-skill, low-wage occupations. If we look solely at projected growth, the list would be dominated by small-scale occupations, where an additional five openings might represent a 50 percent growth rate. For each of the top 20, additional information is provided regarding the likelihood that employment would be part-time rather than full-time, the probability of unemployment, and the education and training requirements. It is information such as this that career seekers need to make good choices.

It is easy to see from the table below that computer occupations dominate the list. Seven of the top 10 occupations are computer related. This may have changed slightly due to the dot.com bust of recent years, but is still reflective of the need for computer-related occupations across all industries. This is best exemplified by the specific list of occupations for advanced manufacturing, where despite being sorted only by new job growth expected, the top occupation is computer related.

It is interesting to note the quartiles for part-time employment and likelihood of unemployment. These are assigned by the U.S. Bureau of Labor Statistics as quartiles, with Very Low (0-25% likely), Low (26-50% likely), High (51-75% likely), and Very High (76-100% likely). The good news is that there is little or no likelihood of part-time employment among the top 20 occupations (Registered Nurses being the exception). However, there is very high likelihood of unemployment among the top occupations, with nine occupations being very likely to experience unemployment, and another four having high likelihood.

Missouri's Top 20 Occupations

Top 20 Occupations

Occupation Title	2001 Employment	Rank of 2001 Employ- ment	2001 Annual Wage	Ranking of 2001 Annual Wage	2000-2010 Growth	Ranking of 2000-2010 Growth	Total Ranking	Part-Time QRT	Unemploy- ment QRT	Education & Training Requirements
Computer Software Engineers, Applications	5,830	97	\$66,760.00	27	55.9%	3	127	Very Low	Very Low	Bachelor's degree
Computer Systems Analysts	9,540	60	\$58,420.00	56	31.0%	26	142	Very Low	Very Low	Bachelor's degree
Computer and Information Systems Managers	5,610	102	\$71,950.00	23	33.4%	20	145	Very Low	Very Low	Degree plus work experience
Lawyers	8,200	73	\$94,090.00	11	23.4%	74	158	Low	Very Low	First professional degree
Sales Managers	6,950	83	\$73,390.00	19	24.8%	56	158	Very Low	Low	Degree plus work experience
Computer Software Engineers, Systems Software	2,900	183	\$66,210.00	29	53.0%	6	218	Very Low	Very Low	Bachelor's degree
Electricians	12,280	47	\$46,230.00	135	25.3%	52	234	Very Low	Low	Long-term on-the-job training
Network and Computer Systems Administrators	3,890	150	\$51,300.00	94	58.4%	2	246	Very Low	Very Low	Bachelor's degree
Network Systems and Data Communications Analysts	2,260	220	\$61,570.00	41	50.3%	7	268	Very Low	Very Low	Bachelor's degree
Computer Support Specialists	9,710	58	\$39,840.00	212	73.7%	1	271	Very Low	Very Low	Associate's degree
Pharmacists	4,790	119	\$70,780.00	24	21.3%	130	273	Low	Very Low	First professional degree
Marketing Managers	4,200	139	\$70,710.00	25	20.5%	140	304	Very Low	Low	Degree plus work experience
Medical and Health Services Managers	4,850	116	\$59,280.00	49	20.2%	143	308	Low	Low	Degree plus work experience
Financial Managers	11,080	51	\$65,290.00	30	14.9%	242	323	Very Low	Very Low	Degree plus work experience
Chief Executives	13,460	40	\$98,490.00	9	12.7%	290	339	Low	Very Low	Degree plus work experience
Sheet Metal Workers	4,780	120	\$41,850.00	193	29.2%	32	345	Very Low	High	Moderate-term on-the-job training
Registered Nurses	51,170	5	\$43,350.00	172	18.3%	169	346	High	Very Low	Associate's degree
Database Administrators	1,540	278	\$55,800.00	68	45.7%	8	354	Very Low	Very Low	Bachelor's degree
Securities, Commodities, and Financial Services Sales Agents	5,020	114	\$54,980.00	72	17.9%	179	365	Low	Low	Bachelor's degree
Construction Managers	4,510	126	\$59,550.00	46	17.1%	198	370	Very Low	Very Low	Bachelor's degree

Note: Last three columns are national data from the U. S. Bureau of Labor Statistics

Career Clusters

Most states across the nation have adopted a career clusters approach to secondary vocational and general education that focus on business-validated skill standards to help guide curriculum, including the full engagement of employers in helping to design curriculum, the creation of industry-led skill alliances to connect to efforts such as job shadowing and work-based learning projects, and numerous other aspects. The National Association of Directors of Career and Technical Education has identified 16 career clusters, with relevant skill standards (www.careerclusters.org). The Missouri Department of Elementary and Secondary Education is moving towards full implementation of a career clusters strategy. This strategy needs a public awareness campaign and the full support of workforce and economic development leaders, as well as that of business and industry and local education leaders.

In terms of choosing career clusters, the Council should turn to MERIC and available labor market information regarding critical clusters and engage in public discussion about the final choices; the chart above is just a start at understanding basic industries and occupations. More complex work can be done that can identify true clusters, and curriculum developed to support those clusters.

Raising Career Awareness

Students at all grade levels can benefit from career awareness, the depths and experiences of which vary widely by age. For example, third graders might receive a “what my dad does” type of simple exposure, while 9th graders might undertake a job shadowing assignment.

The Missouri Training and Employment Council has targeted more employer engagement as a critical strategy in improving the state’s education system. However, the need to engage employers is often countered by overburdened employers who are asked to do too much. Employers that tend to participate in these types of activities are typically rewarded with a “no good deed goes unpunished” spirit by being invited to participate in the next initiative.

One way to address the employer burden issue is to have a clearly charted path, whereby employers can see where and when they fit in with education and work-based learning as they look across a continuum.

The career development continuum shown below is just one sample framework for when and how employers can partner with the education system. It should be viewed as a starting point for dialogue, and revised as necessary to fit the needs of Missouri.

Career Development Continuum

	Elem. School	Middle School	Grade 9	Grade 10	Grade 11	Grade 12	Postsecondary Education/ Employment
Guest speakers in classrooms	↓	↓	↓	↓	↓	↓	
Career Fairs		↓	↓	↓	↓	↓	
Interest assessments		↓	↓	↓	↓	↓	
Labor market information	↓	↓	↓	↓	↓	↓	↓
Field trips / Workplace tours	↓	↓	↓	↓	↓	↓	
Student-run enterprises		↓	↓	↓	↓	↓	
Employer-defined projects (e.g., robotics competitions)	↓	↓	↓	↓	↓	↓	
Service Learning	↓	↓	↓	↓	↓	↓	↓
Access to a job reference library and job listings				↓	↓	↓	↓
Career planning / Counseling			↓	↓	↓	↓	↓
Job Shadowing		↓	↓	↓	↓	↓	↓
Mentoring	↓	↓	↓	↓	↓	↓	↓
Unpaid internships			↓	↓			
Project-based experiences that teach transferable skills		↓	↓	↓	↓	↓	↓
College and work - readiness curriculum			↓	↓	↓	↓	↓
Paid internships/work-based learning experiences					↓	↓	↓
Postsecondary prep (ACT prep, financial aid, college visits)			↓	↓	↓	↓	
Dual enrollment (high school & college) programs					↓	↓	↓
Reconnecting out-of-school youth to education, training, and employment			↓	↓	↓	↓	↓

Source: adapted from Education for Employment Office, School District of Philadelphia, and taken from *Engaging Chicago Employers: Fostering High-Quality Career Awareness and Youth Internships*, Prepared by Marcia Festen and Debra Hass, January 2002.

Getting Real¹⁴ about Workforce Preparation

As Missouri strengthens its ties between business and education, it is important to circle back to the targeted clusters. While many top occupations in the clusters require a college education, many do not. Health Services, a sector within Life Sciences, has a great number of support occupations that do not require advanced degrees. Even beyond the clusters, many top jobs across all industries, particularly in those that are service-related, do not require advanced degrees.

In addition to a population that is more highly educated, Missouri also needs a working population with the appropriate skills to ensure a balanced labor market. The alternative is underemployment or unemployment, if too many are in one occupation, but educated or trained for a completely different occupation.

According to the U.S. Bureau of Labor Statistics, of the 2.8 million teens who graduated from high school nationwide in 1997, 67 percent were enrolled in college the following October; within two years of graduation, 72 percent were enrolled. But while college enrollments grow, so do college remediation and dropout rates. By the late 1990s, college dropout rates from the institution that the student originally enrolled were at record levels. Two thirds of all college students now withdraw at least once before finishing, 41 percent of students now enrolled at two-year institutions are in remedial courses; the current rate of students who graduate four-year programs within six years of entry is only 52 percent. Additional data shows only 40 percent of the nation's teens graduate from high school with the academic skills needed to go to college.¹⁵

According to Dr. Kenneth Gray, author of *Getting Real: Helping Teens Find Their Future*, the above data combines with three other factors to form a “paradox between college expectations and realities.” These factors are:

- Teens say the main reason they were going to college was to get a good job (American Council on Education, 1998), yet they are doing so without good judgment; while 67 percent of the high school class of 1997 enrolled in higher education immediately after graduation, and about two of three matriculated in four-year colleges to earn bachelor's degrees, but only 23 percent of all employment requires this level of education¹⁶ (and in 2000 that figure declined to only 20 percent).
- While increasing numbers of college graduates are ending up in low-wage service jobs, the nation's economy is generating record numbers of unfilled positions for technicians in high-skill, high-wage technical jobs. The problem is not an

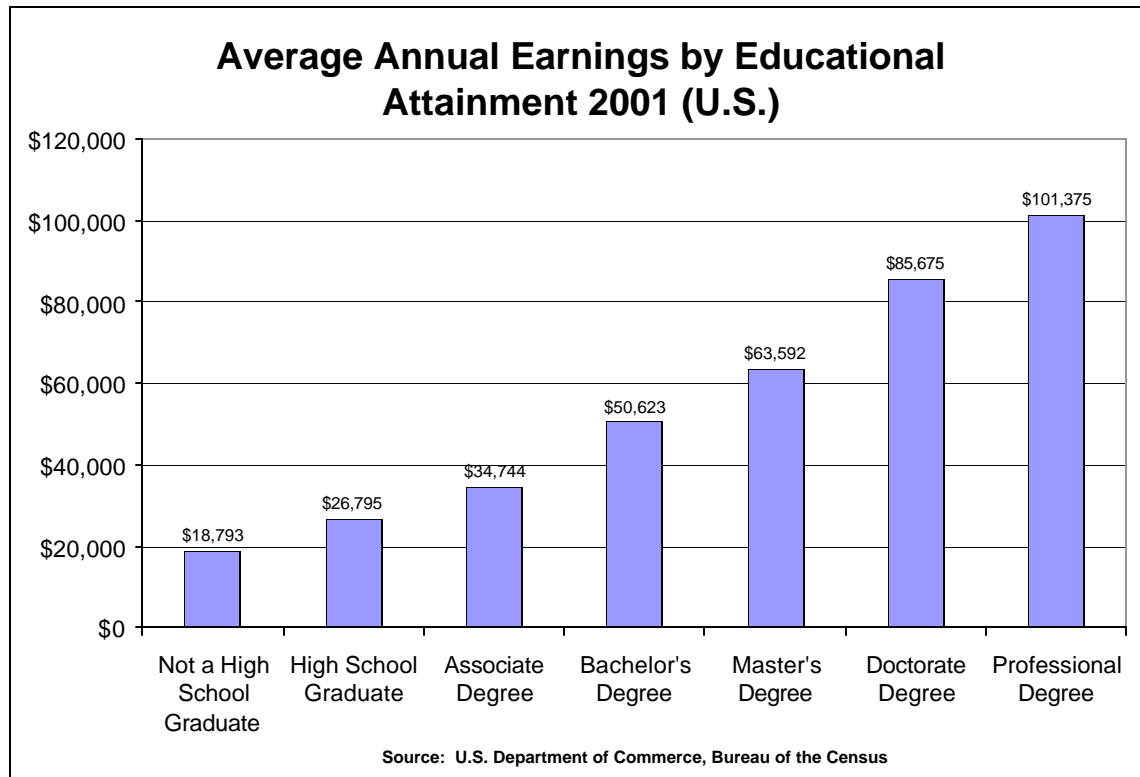
¹⁴ *Getting Real: Helping Teens Find Their Future*, Dr. Kenneth Gray, Professor of Education in the Workforce Education and Development Program, College of Education, Penn State University, Corwin Press Inc., 2000.

¹⁵ Paragraph excerpted from *Getting Real: Helping Teens Find Their Future*, Dr. Kenneth Gray, Professor of Education in the Workforce Education and Development Program, College of Education, Penn State University, Corwin Press Inc., 2000.

¹⁶ *ibid*

undersupply of college graduates, but rather an undersupply of technically skilled graduates.

- Many young adults have become “reverse transfers,” enrolling in one and two-year technical programs at community colleges even though many had already had four-year and even graduate degrees. In Missouri, we find two reasons for this occurring. First, they hoped it would give them what their bachelor’s degrees had not – an advantage in competing for high-skill/high-wage employment. Second, they are enhancing their current skills or acquiring new skills.



The realities of this situation dictate a need for an open and honest dialogue among our policy leaders in the State of Missouri. This is not meant to de-emphasize the value of education. On the contrary, Missouri has a number of cluster and non-cluster occupations that enjoy high wages, but require advanced education. Furthermore, data has long-supported the notion that the more education an individual acquires, the more likely he/she is to achieve a higher degree of career mobility and earnings.

New Goal for Graduating High School Students: Career Maturity

Dr. Gray suggests a framework that appears to have a great deal of intuitive validity. He suggests that in addition to preparing students to succeed in post-secondary education, the goal of secondary education should be that every student leaves with

sound career information and a career plan that has a high probability of success based on their interests, values, and educational achievement.

Dr. Gray's calls his framework "Career Maturity," demonstrated by teenagers of high school age when they:

- Understand the importance of narrowing career interests as a basis for postsecondary planning;
- Have, by the 10th grade, identified one or more career interests after an objective evaluation of their likes and dislikes, their aptitudes, and labor market projections;
- Have, by the end of 12th grade, engaged in activities to verify these choices;
- Used these choices to make post-high-school decisions.

The A+ Schools Program mentioned earlier is an interesting reflection of this direction. Its language includes the goal that students need to have a career plan, and graduate with the skills and knowledge required for career success or further education. The State's other efforts to ensure work readiness, along with the development of a cross-sector skills curriculum, will go a long way toward better alignment between the education demands of the workplace and the educational attainment of the population.

Changes Needed in the Education System

Uniform articulation and dual credit mechanisms must be established between secondary schools, community college, and university levels to provide degree credit for education and skills-based training. Over 3,000 public two-year students moved on to public four-year institutions within Missouri during the fall of 2001. This is a significant number. During 2001 there were 20,313 total degree-seeking and non-degree-seeking undergraduate transfer students, and another 20,941 in 2002. The single largest source of transfer students is from out-of-state colleges and universities (6,373 in 2002). However, that means there were still over 13,000 in-state transfers.

The above data illustrate the need for articulation agreements between various levels of education so that like courses and credits transfer seamlessly between institutions. This includes two-year to four-year institutions of higher learning; it also includes high school to two-year colleges; high school to four-year universities; vocational schools to community colleges, and others.

Yet, in addition to academic articulation agreements, the higher education system must award credits for workplace and skill-based training. One of the means by which to do this might be to look at leveraging public and private programs together in order to streamline efforts, reduce redundancy, and reward skill accomplishments achieved through workplace experience with higher education credits. Reducing the "seat time" required to gain credits and credentials will save both personal and public time, and expenditures for education, and increase the number of credentialed workers in the

state. It would also facilitate the movement of labor in the economy by allowing workers to move seamlessly in skill development through work and education along career paths to higher-level jobs.

The graphic shown above regarding salaries indicates the importance of higher education to wage earnings. Articulation can help workers move more smoothly along this path.

The next graphic indicates the relationship between public two-year and public four-year institutions in Missouri. This is a detailed view of how Missouri students are moving between various 2 and 4-year institutions. Over 3,000 students are transferring annually, which serves to reinforce the need for articulation agreements.

Where the Majority of Public Two-year Transfer Students Attend Public Four-Year Institutions, Fall 2001

Public Two-Year College	Total Transfers	Central	Harris-Stowe	Lincoln	Mo. South	Mo. West	NW	SE	SW	Truman	UMC	UMKC	UMR	UMSL
Crowder	115				71%				15%					
East Central	122	11%						9%	20%		17%		12%	23%
Jefferson	154							37%			8%		9%	33%
Linn State	9	78%		11%	11%									
Metro CC–Blue River	9						100%							
Metro CC–Longview	370	41%							8%		7%	37%		
Metro CC–Maple Woods	186	24%				18%	9%		8%			33%		
Metro CC–Penn Valley	144	14%										65%		
Mineral Area	93							47%	15%		10%			12%
Moberly	111	21%								10%	48%			
North Central	94					35%	24%		10%		17%			
Ozarks Tech.	143								98%					
State Fair	133	59%							11%		13%			
St Charles	261								10%		18%			58%
St Louis CC–Flo Valley	268		13%											65%
St Louis CC–Forest Park	209		31%											54%
St Louis CC–Meramec	612								10%		20%			51%
SW-West Plains	5	40%					20%	40%						
Three Rivers	142							72%	15%					
Total	3,180	12%	4%	1%	3%	3%	3%	10%	12%	1%	12%	10%	3%	27%

School Rigor and Teacher Development

The Missouri Training and Employment Council supports the recommendation of the Missouri Business Education Roundtable. The Council emphasized the *Teachers as Professionals Section*, which includes: develop a more proactive teacher recruitment strategy and strengthen teacher retention policies; improve teacher preparedness; and reinforce the perception of teaching as a profession.

Also, high school graduation requirements must be more rigorous including four years of English and three years each of social studies, mathematics and science. The Council supports: adopting DESE's High Schools That Work standards for all high school; increasing high school and postsecondary graduation rates; developing of a 21st Century workforce curriculum for Missouri; and teach customer service concepts in the schools.

Missouri Best Practices: Improving the Emerging Worker Pipeline

School rigor, teacher development, and articulation agreements are three aspects of improving worker readiness. There are other systemic improvements that can be made to the educational system. The following is just a sample of the Missouri best practices that are improving the workforce investment system. These initiatives actively solicit support and sponsorship roles for organized labor, business and industry.

Math Academies

To compete in the global economy, Missouri students need to be skilled in higher order mathematical reasoning and algebraic thinking. Missouri's Mathematics Academy recognizes that the teacher's depth of understanding of mathematics has a direct relationship to student performance. It has been determined that many middle-school mathematics teachers are not trained in algebra, geometry, or the most effective methods of teaching mathematics.

To respond to this need, the Missouri Mathematics Academy was developed to train the 2,000 plus middle-school mathematics teachers in state-of-the-art algebra and geometry concepts, and the most effective instructional practices. The Academy focuses on improving the student's real-world application of mathematics.

While the program is a joint effort of four different public agencies, the success ultimately hinges on the participation of Missouri school districts and the financial support of businesses interested in a highly skilled workforce. The Academy is seeking businesses to financially support training of middle-school mathematics teachers in their communities. Consider also the potential impact this program has on helping to improve the academic rigor associated with math, as discussed in an earlier section.

The Center for Construction Excellence

The Center for Construction Excellence is a construction industry initiative that also focuses on middle-school students. The Center is located at the University of Missouri-Kansas City, in the School of Engineering. The Center was created to increase student participation in math, science, English, and technology education courses. Other goals include increasing the number of individuals (particularly females and minorities) entering technical careers such as construction. The initiative also encourages increased adult education and professional education within the construction industry. The Center's success with students is due to collaboration and integration among professional construction organizations. Each year students compete in the CCE Middle School Design Build Competition. The program has grown from 64 students in 1998 to over 3,200 students in 2003. With fifty-percent female and forty-percent minority participation, the annual build competition reaches a broad cross-section of students. This program is paid for through industry donations and grants.

New Career Education Teacher Mentoring

Missouri school districts are required to provide each new teacher with a mentor. The in-district mentor is usually most helpful in training in local policies and procedures. And unless the in-district mentor teaches vocational education subjects, the mentor will not necessarily be well versed in the unique issues that face new vocational education teachers in areas such as equipment, curriculum and instruction, and career and technical student organizations. A mentoring program is being developed and implemented for all vocational education teachers who are first- or second-year, or returning to the classroom after an absence.

During the Missouri Association for Career and Technical Education summer conference, mentors were trained and will be paired with protégés in their subject matter area. Their work will begin in September 2003 by attending a one-day session, and also attending an additional one-day meeting later in the year. Both the mentors and protégés will keep and submit logs on a quarterly basis, and develop two structured experiences and two independent experiences through the year. There will be recognition of the mentors and protégés for their work together during the 2004 summer vocational conference.

Guidance Counselor Academies

The Divisions of Vocational and Adult Education and Workforce Development are working with the Department of Higher Education and Central Missouri State University to develop a Counselor Academy. The Academy will meet three times during the year, and is designed to assist school counselors in the development and dissemination of information concerning career awareness, exploration, choice, and helping high school students develop a four-year plan of study. The importance of career awareness and career guidance for high school students has been well

documented. By giving all counselors training in aligning their career awareness and career guidance activities, students will be less likely to reach their senior year of high school unprepared for the future. The Counselor Academies will correlate academics with career choices so that students and families can understand and be prepared for work/education needed after high school. Additionally, the Academy will enable counselors to comply with No Child Left Behind by providing counseling, mentoring, and pupil services for all students so they can plan for their future by making informed career decisions.

Develop Your Future™ and Kuder® Skills Assessment

Develop Your Future™ and the Kuder® Career Planning System are statewide initiatives to assist students in grades 7-14 access to career assessment and planning resources. Develop Your Future™ and the Kuder® Career Planning System, powered by Kuder®, will be provided to all high schools, area vocational schools, community colleges, and apprenticeship consortiums in Missouri.

The Kuder® Career Planning System combines an online career portfolio with the research-based Kuder® Career Search interest inventory, Kuder® Skills Assessment, and Super's Work Values Inventory®-revised. Assessment results are empirically aligned with the Missouri Career Clusters, customized with direct links to local resources, and provided immediately upon completion of the assessments.

Develop Your Future™ is a step-by-step career planning curriculum that creates optimal integration of classroom instruction and web-based resources.

Raising Public Awareness

Comprehensive public awareness campaigns must be deployed to raise Missourians' aspirations and expectations for education and training, and their relation to economic survival and growth. Public awareness campaigns can be long and difficult processes. Consider that efforts for recycling, breast cancer awareness, Mothers Against Drunk Driving, and others have all had periods of start-up and momentum shifts. Community campaigns can be very difficult to manage. The Council and its stakeholders should be prepared for this work because what they seek to change is of vital importance to the state. This is where the Governor and General Assembly can help spread the message and use the bully pulpits of their offices to stress the importance of these issues.

The Council should consider these four points as they embark on the campaign:

Considerations for a Community Campaign

1. Identify a strategic theme that resonates with the public.
2. Be aware of existing initiatives and build on existing energy.
3. Sweep people in by creating an environment of inclusion and creating a coalition strong enough to support and guide the actions.
4. Build an infrastructure for action by recognizing that time and attention are scarce resources, and determining what needs to be paid the most attention.

By following these recommendations, the Council can develop an exciting message that will be well received, can maximize the existing efforts and energies of others, can be inclusive, and ultimately, can pay attention in such a way that initiatives continue to experience strong forward progress.

Collaboration Results In Better Outcomes

Community change cannot be accomplished alone. All Missourians will play a role, some more specifically than others. If Missouri is to be competitive, a variety of partners will need to make a variety of commitments as they join the effort.

What EDUCATORS must do

- Assist in enhancing literacy among Missourians.
- Help make academic standards more rigorous, including mandating four years of English and three years each of social science mathematics and science.
- Help establish and promote worker readiness credentialing.
- Promote continuous learning and skill development at all levels through college.
- Develop results-driven partnerships that promote the interests of Missouri business and industry first and foremost. Under this model, business is the customer; successfully prepared students are the product.
- Support and participate in professional development activities that are known to work, such as academies, to enhance the content and instruction technique.
- Establish performance goals for education that include measures of student achievement.

What BUSINESS and BUSINESS ASSOCIATIONS must do

- Support the first eight strategies outlined in this report.
- Support the State Board of Education in establishing more rigorous high school graduation academic standards and a worker readiness credential.
- Develop results-driven partnerships with education to promote the interests of children and assist in their transition from school to rewarding careers.

What WORKERS must do

- Engage in self-improvement through continuous learning and skill development.
- Embrace change and learn new technologies.

What the GENERAL ASSEMBLY must do

- Actively support the first eight strategies outlined in this report.
- Increase financial support for continuous learning and skill development for adults.
- Forge improved working relationships between business and organized labor to ensure Missouri's economic competitiveness.

What PARENTS must do

- Engage in continuous learning.
- Be constructively involved in their children's education.
- Be knowledgeable about the local school district's performance and funding.
- Become aware of the range of post-secondary opportunities, including careers in technical fields.
- Engage the school districts in a dialogue regarding the state of the workforce, the needs of local business and industry, the alignment of curriculum, and school performance.

What STUDENTS must do

- Take the Missouri Assessment Program (MAP) seriously.
- Recognize that higher school attendance rate is important for academic success.
- Understand the importance of transcripts.
- Consider their career options and discuss them with their parents, counselors and others.

What LOCALWORKFORCE BOARDS must do

- Provide a credible basis for convening key stakeholders and building consensus on what the issues are.
- Create a blueprint for which issues to tackle.
- Pull together resources to resolve the issues.
- Engage the community to gain support for change.
- Hold those accountable to deliver results.
- Conduct regional analyses and develop regional state of the workforce reports.

Use Gap Analyses to Identify Target Industries and Occupations

State agencies must work with local workforce investment boards to conduct regional supply/demand gap analyses to identify the needs of business and industry, and identify targeted industries/occupations for each region of the state. This report, like a number of reports before it, attempts to frame issues and conversations through key data points. One of these data points is the identification of key industries and critical occupations, and ultimately the knowledge, skills, and abilities associated with those critical occupations.

Supply-Demand Gap Analysis

Understanding key industries and occupations, and associated knowledge and skill characteristics, takes careful and thoughtful analysis using a variety of tools. One such tool can be a supply/demand gap analysis.

Labor market information does a great job of capturing the demand side, including employment by industry and occupation. However, there is very little data regarding the supply of labor; e.g., do we have enough biotechnology workers? What are the skill levels of our population?

Gap analysis attempts to measure supply, typically using a variety of resources and information, including proprietary surveys of workers, census data including occupation identifiers, skill assessments conducted at some type of mass-regional level, and economic modeling techniques.

The most popular method is through analysis of higher education and vocational education programs, and program enrollment relative to forecasted growth of related occupations (demand, measured by labor market information).

For example, if there are 1,000 new nursing positions expected to open up annually through 2010, yet there are only 400 new nursing students registering in a state's higher-education institutions each year, there is a significant imbalance. This can be met by recruiting from out-of-state (assuming the state keeps all in-state students), or by a variety of other means.

The gap analysis tool in this approach is useful as a sign of things to come, although it can be complex to assemble. The nursing example above is convenient because it is a somewhat safe assumption – all other factors aside – that a nursing student is qualified to serve in the occupation of nurse. However, what occupations are Bachelor of Arts graduates likely to go into? The relationships are not as clear. Similar questions apply to business management, where graduates may be equally prepared for business or management careers.

Given the nature of these somewhat subjective links between education and training programs and occupations, it is important that this be an iterative process that includes labor market analysts, educators, economic developers, training institutions, and business in active dialogue about skill needs and skill gaps, and how to fill them.

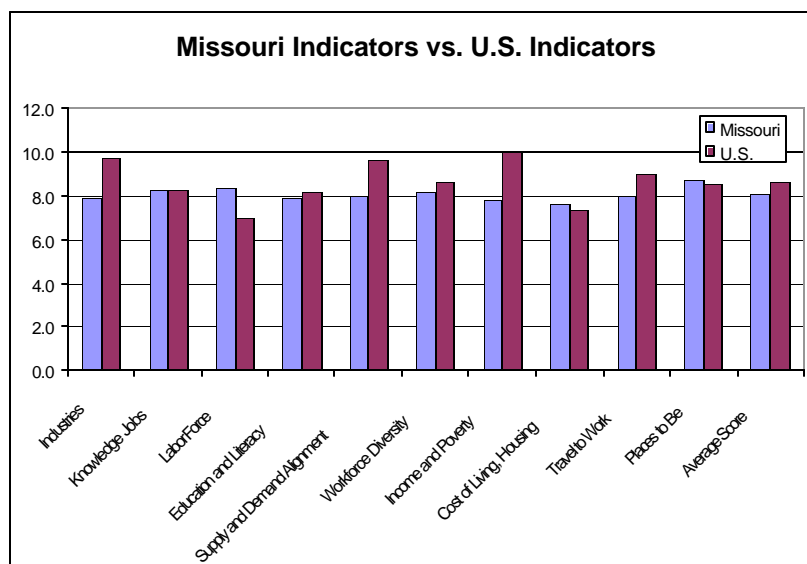
Using Comparative Workforce Indicators to Identify Competitive Workforce Advantage(s)

The State of Missouri must endeavor to understand its competitive workforce advantages and challenges, relative to its key economic rivals among neighboring states. With that in mind, the Corporation for a Skilled Workforce (CSW) applied its Comparative Workforce Indicators® series of 10 key indicators (supported by over 40 “behind-the-scenes” data points), using data from Missouri, Illinois, Iowa, Kansas, and national data.

These indicators provide a comparative view of advantages and challenges for the State of Missouri relative to its key neighbors. The report – **Comparative Workforce Indicators for the State of Missouri** can be found at

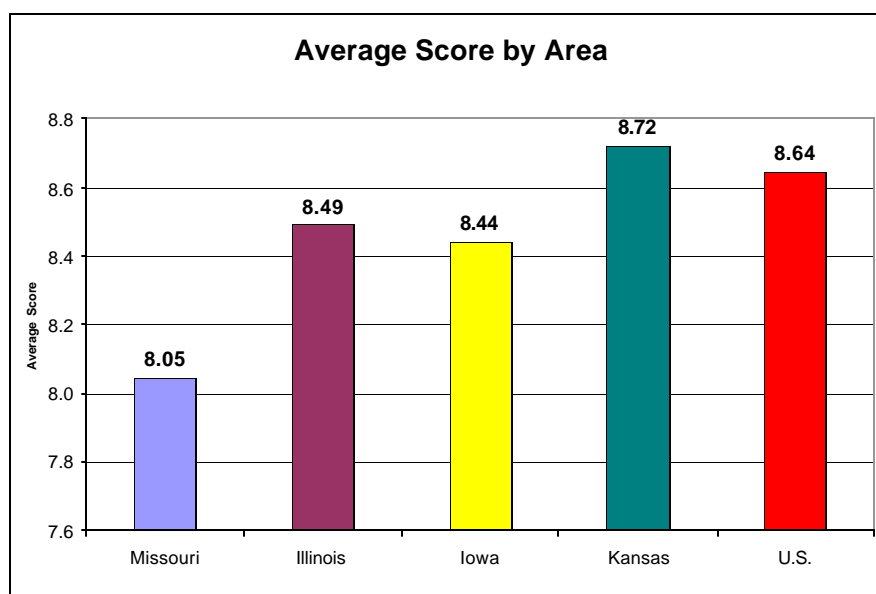
<http://www.ded.mo.gov/employment/mtec/>

Two overview graphics of how Missouri fared are included here. The detail supporting these charts is available in the full report.



It is important to note that the Comparative Workforce Indicators are comparable only for the specific areas under study – the scores are computed only by comparing these five areas against one another. No conclusions can be drawn from this between Missouri and say, Texas or Florida, or any other state other than Illinois, Iowa, and Kansas. If Missouri was compared to another set of five different states, its score would change. The score is not absolute; that is, it is only a means of quantifying how a given set of states or regions

compares to others within the set. The U.S. is included to represent some type of average. A complete data methodology is included in the full report.



Why bother with Comparative Workforce Indicators? CSW has found that across the country, many workforce boards and policy makers are struggling with the “dashboard of indicators” that can inform them of key policy needs. Many boards are provided mountains of data and information, but have neither the time nor the subjective matter expertise to sift through it all. These indicators are an attempt to use publicly available secondary data, bundled in a new and innovative way that streamlines a lot of data into more understandable chunks, which can also allow comparisons to other types of areas, regardless of size (states, cities, counties, multiple counties, sub-counties, etc.).

A full report dealing with Missouri’s indicators comprise their own document because of the need to focus this report on the underlying educational currents swirling around the economic potential of the state. However, the indicators can be used to identify where resources might be best placed. Consider how Missouri fared in the following ten major indicators:

Summary of Missouri Indicators vs. United States

Indicators Missouri Ranked Above the U.S.	Indicators Missouri Ranked Below the U.S.	Indicators Missouri Equaled the U.S.
➤ Labor Force	➤ Industries	➤ Knowledge Jobs
➤ Cost of Living, Housing	➤ Education and Literacy	
➤ Places to Be	➤ Supply and Demand Alignment	
	➤ Workforce Diversity	
	➤ Income and Poverty	
	➤ Travel to Work	

In addition to the full report, a complete list of the data points within each of the 10 major indicators above can be found in Appendix B of this document.

Balanced Scorecard for Overall System Performance

Comparative Workforce Indicators are an effective and informative use of secondary information to tell a consistent story across a wide variety of areas in order to identify competitive strengths and weaknesses. That is but one side of the story.

The other side of the story is data and intelligence about how the system itself is performing in terms of moving any one or more of those other data points seen in the indicators. For example, is the system helping in some way to move the literacy rates, educational attainment rates, or employment rates? How can we measure the system without getting into the micro-management of individual program performance?

It is critical that Missouri's state and local workforce investment boards, career centers (One-Stop centers), education entities, and economic development entities be able to evaluate collective system performance, and determine whether their integrated efforts are moving toward their vision of excellence. Education outcomes reflect success in developing a skilled and educated citizenry; skilled and educated citizens become productive employees and contribute to the economic prosperity of the state; economic prosperity leads to a quality of life Missouri can use to draw both business and new citizens. One way to address this is to talk about a balanced scorecard of performance measures and indicators.

CSW, in a separate report entitled **Developing a Balanced Scorecard to Measure the Effectiveness of Missouri's Workforce Investment System** proposes that the state look at four overall categories – employer outcomes, outcomes for individuals, financial viability, and internal controls as indicators of a high quality One-Stop system. CSW also proposes that supplemental scorecards be developed for both the educational system and the economic development system that identify both leading and lagging indicators.

- For example, **employer outcomes** can include employer satisfaction, repeat usage rate, and market share. Measurement of these outcomes can disaggregate how well the system serves employers in the target clusters compared to all employers.
- **Outcomes for individuals** can include customer satisfaction, increased earnings, training-related placements, and market share. Measurement of customer outcomes can focus on individuals who were enrolled in training that would prepare them for occupations in the target clusters.
- **Financial viability** can include diversity of core funding, external fundraising, fee-for-service activities, partner contributions, and cost per customer.
- **Internal controls** can include spending variations, customer-to-staff ratio, and reduced processing time.

Once the performance measures are refined, the Missouri Training and Employment Council will recommend that they be included in the Governor's Missouri Results Initiative.

Moving to Another Level of Measurement and Understanding

This State of the Workforce Report, along with the Comparative Workforce Indicators and the Balanced Scorecard, are all efforts to put better data into the hands of those who are conversing and making decisions regarding workforce, economic, and education policy. Data is useful to set a baseline from which to measure change over time, or to use as a benchmark in comparing one's self to others.

Benchmarking is a useful tool when trying to compare local practices with the practices of the industry leaders. Understanding that the work of workforce industry leaders is a tough and arduous task is of great importance in recognizing that if we can learn from the success of others, we can potentially move farther faster. Success in these endeavors is often the result of unique local conditions such as leadership or community involvement that may not be replicable in other areas. Nevertheless, emulating the characteristics of the industry leaders to the greatest extent possible is more likely to result in enhanced performance.

CSW has done work in over 40 states with hundreds of local workforce boards and stakeholder organizations. Based on this experience, and often with the funding support of federal leadership such as the U.S. Department of Labor, CSW has developed:

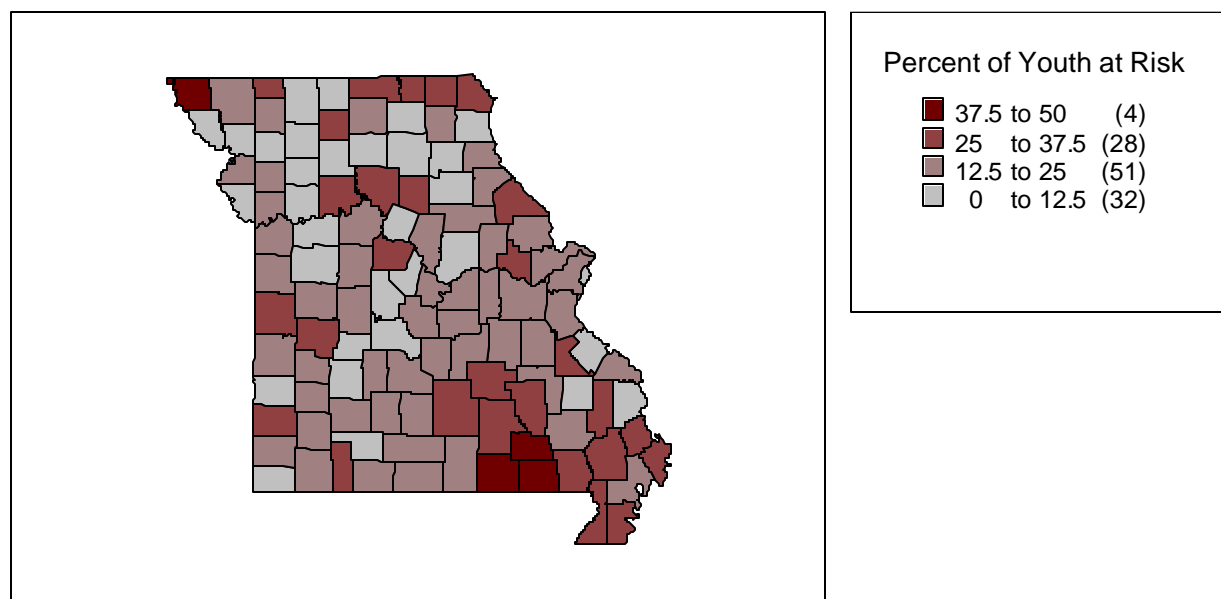
- A benchmarking of One-Stop centers including identification of "critical success factors" that characterize the centers that are widely acknowledged as leaders in the field;
- A report on practices of innovative workforce investment boards, including composition, leadership, decision-making structure, and other success factors including content focus.
- A benchmarking of youth councils, including composition, leadership, decision-making structure, and other success factors including content focus.

As Missouri continues along the path of informed workforce policy based on data and intelligence, it should consider benchmarking itself to the best practices across the nation.

Develop Regional State of the Workforce Reports

In collaboration with other organizations, local workforce investment boards must develop regional state of the workforce reports, based in part on data from the supply/demand gap analyses. These reports must guide policy and operational decision-making, as well as resource allocation. As mentioned earlier, the Missouri Economic Research and Information Center (MERIC) has launched “Target Missouri II” (TM2). TM2 is a MERIC-inspired initiative to both revive and revamp the idea of targeting industry clusters. The new system will take account of sub-economies within the state, because of the belief that different industries affect regions differently. MERIC will evaluate the current industry mix within a region; identify which industries generate the greatest economic impact; look at site selection criteria; gauge a region’s capacity to attract certain industries; and assist them in developing short-term and longer-term economic development strategies.¹⁷

Coupled with potential supply and demand gap analyses discussed previously, local areas should develop their own state of the workforce reports. These reports should be driven and informed by data, but should ultimately factor in the anecdotal direction of the region and work to date, such as efforts already underway to foster new relationships with local education and training providers.



Local areas should also consider development of the Comparative Workforce Indicators for all 14 of Missouri’s local areas. Done together, the state and local partners can benefit from cost efficiencies. Furthermore, it would allow policy makers to quickly identify local strengths and challenges relative to neighboring areas and the state. For

¹⁷ <http://www.ded.state.mo.us/business/researchandplanning/industry/targetii/index.shtml>

example, two neighboring areas might see that together they have the biggest challenges in literacy, and thus begin to work collaboratively on literacy initiatives.

Clear relationships can be portrayed through the use of geographic information system graphics (like the graphic above showing ratios of at-risk youth).

Appendix A: New Economy Definitions

Percent of IT Professionals Employment in information technology (IT) occupations in non-IT industries as a share of total jobs.

Manufacturing Workforce Education A weighted measure of the educational attainment of the manufacturing workforce.

Gazelle Jobs Jobs in gazelle companies (those with annual sales revenue that has grown 20 percent or more for four straight years) as a share of total employment.

Commercialized Internet Domain Names The number of commercial Internet domain names per firm.

Digital Government A measure of the utilization of digital technologies in state governments.

Scientists and Engineers Civilian scientists and engineers as a percent of the total workforce.

Industry Research and Development Investment Industry investment in research and development as a percentage of Gross State Product (GSP).

Venture Capital Venture capital invested as a percentage of GSP.

Appendix B: The Comparative Indicators

These 10 **macro** indicators are at the basis for the overall chart comparing Missouri to the U.S. on page 10. **Micro** indicators are those that are listed in bullets.

Industries

- Industrial Diversity
- Growth in Business Establishments, 1997-2002
- Rate of Job Growth, 1992-2002
- Total Job Growth, 1992-2002
- Rate of Job Growth, 2000-2002
- Total 2001 Sales, All Industries
- Average 2001 Sales per Business

Knowledge Jobs

- Percent Managerial, Professional, and Technical Jobs
- Average Skill Level Top 25 Occupations
- Innovation: Average Patents per 10,000 Employees, 1995-1999
- Change in Occupational Wages, 1997-2001

Unemployment and Labor Force

- Change in Unemployment Rate, 1992-2002
- Current Unemployment Rate, July 2003
- Labor Force Attachment

Education and Literacy

- Educational Attainment, Bachelors Degree and Higher
- Educational Attainment, Associates Degree and Higher
- Level 1 Adult Literacy Rates
- Level 1 and 2 Adult Literacy Rates
- Percent Not Speaking English Well as a Second Language
- At-Risk Youth

Supply and Demand Alignment

- Growth Alignment
- Occupational Alignment
- Educational Alignment

Workforce Demographics and Diversity

- Balance Between Entry and Exiting Workforce
- Change in Age by Years, 1990-2000
- Racial and Ethnic Diversity
- The Glass Ceiling
- Percent of Disabled Workers who are Employed

Income and Poverty

- Median Household Income
- Median Value of Owned Homes
- Percent of Families in Poverty
- Percent of Families with Single Female Parent
- Average Annual Public Assistance Income per Household

Cost of Living, Housing

- Monthly Housing Costs as Percent of Monthly Income
- Home Value to Annual Income
- Vacant Housing Rate

Travel to Work

- Mean Travel Time to Work in Minutes
- Solo Drivers per Square Mile
- Percent Using Public Transportation or Carpooling to Travel to Work

Perceived Quality of Life

- Population Growth, 1990-2000
- Household Internet Access
- Mobility: Percent of Population Living in a Different State in 1995
- Average Home Appreciation, 1995-2000